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# ANIMAL KEEPERS' FORUM



The Journal of the American  
Association of Zoo Keepers, Inc.

**JULY 2003**

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also serves as AAZK Liaison to the American Zoo & Aquarium Association (AZA)

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### **AAZK PUBLICATIONS - CONTINUING DATA COLLECTION**

Biological Values for Selected Mammals, 3rd Edition - Jan Reed-Smith, Lake Odessa, MI

AAZK Enrichment Notebook - Lee Houts, Folsom City Zoo





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## About the Cover.....

This month's cover features a Red Ruffed Lemur (*Varecia variegata rubra*) drawn by Dan Alldredge, a Keeper at Mesker Park Zoo, Evansville, IN. This prosimian is found only in N.E. Madagascar on the Maasoala Peninsula near Maroansetra. Deforestation and being hunted for food are prime factors in its endangerment. Its color is rusty red (fox color) with stomach, forehead, face and inside of limbs black. There is a patch of white behind the neck and at the base of the tail. After an early summer breeding, the females bear 3-4 offspring after a gestation period of approximately 90 days. Their diet consists of fruit, nectar and seeds found abundantly in their forest habitat. They have up to 12 distinct calls in the vocal repertoire. Life expectancy for this species is 15-20 years. Primary predators besides man are eagles, boas, hawks and fossa. Thanks, Dan!

Animal Keepers' Forum publishes original papers and news items of interest to the animal keeping profession. Non-members are welcome to submit articles for consideration. Articles should be typed or hand-printed and double-spaced. Authors are encouraged to submit their manuscripts on a disk as well as in hard copy form. Manuscripts submitted either on disk or electronically as attachments to an email should be submitted in Microsoft WORD. All illustrations, graphs, charts and tables should be clearly marked, in final form and should fit in a page size **no greater than 5.5" x 8.5"** (14cm x 22cm). Literature used should be cited in the text (Brown, 1986) and alphabetically in the final bibliography. Avoid footnotes. Include scientific name (as per ISIS) the first time an animal name is used. Thereafter use common name. Use metric system for weights and measurements (standard equivalents may be noted in parenthesis). Use the continental dating system (day-month-year). Times should be listed as per the 24-hour clock (0800, 1630 hrs. etc.). Glossy black and white **or** color prints (minimum size 3" x 5" [8cm x 14cm] ) are accepted. Clearly marked captions should accompany photos. Please list photo credit on back of photo. Photographs may be submitted electronically as either JPEG or TIFF file attachments.

Articles sent to Animal Keepers' Forum will be reviewed by the editorial staff for publication. Articles of a research or technical nature will be submitted to one or more of the zoo professionals who serve as referees for AKF. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Lengthy articles may be separated into monthly installments at the discretion of the editor. The editor reserves the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed, appropriately-sized envelope. Telephone, fax or email contributions of late-breaking news or last-minute insertions are accepted as space allows. Phone 1-800-242-4519 (US); 1-800-468-1966 (Canada); FAX (785) 273-1980; email is [akfeditor@zk.kscoxmail.com](mailto:akfeditor@zk.kscoxmail.com)<

**Deadline for each regular issue is the 10th of the preceding month.**

**Dedicated issues may have separate deadline dates and will be noted by the editor.**

Articles printed do not necessarily reflect the opinions of the AKF staff or the American Association of Zoo Keepers, Inc. Publication does not indicate endorsement by the Association.

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**AAZK Website Address: [www.aazk.org](http://www.aazk.org)**

**BFR Website: <http://bfr.aazk.org>**



# *Scoops & Scuttlebutt*



## **2003 AAZK Board of Directors Election Results**

The results of the election for the AAZK Board of Directors have been announced by NEC Election Chair Sheri Leavitt. Re-elected to serve on the AAZK Board of Directors is Kevin Shelton, The Florida Aquarium, Tampa, FL and Jacque Blessington, Kansas City Zoo, Kansas City, MO. Newly elected to the AAZK Board are: Jeannette Beranger, Roger Williams Park Zoo, Providence, RI and Shane Good, Cleveland Metroparks Zoo, Cleveland, OH. Retiring from the AAZK Board will be Linda King, Dallas Zoo, Dallas, TX.

New and re-elected Board Members will serve a four-year term from the close of the 2003 National Conference until the conclusion of the 2007 National Conference. Continuing their unexpired terms on the AAZK Board are: Bruce Elkins, Indianapolis Zoo, Indianapolis, IN; Bob Hayes, Zoological Society of San Diego, San Diego, CA; and Denise Wagner, San Diego Wild Animal Park, Escondido, CA.

AAZK Board Members are elected in a secret ballot voted upon by the Association's 1600+ Professional Members. Ballots are sent by voting members to an independent CPA firm which tabulates and verifies the results. It is the responsibility of the AAZK Board to plan and chart the future progress of AAZK and oversee its committees and programs, as well as working to help the organization remain financially stable and secure.

Congratulations to the newly elected and re-elected members of the AAZK Board, and sincere thanks and appreciation to all those who chose to be candidates in the 2003 AAZK Board election.

## **Polar Bear Meeting Scheduled for 2004**

Polar Bears International (PBI) in association with American Zoological and Aquarium Association's Bear Taxon Advisory Group (Bear TAG) is formally announcing the International Polar Bear Husbandry Conference to convene 4-7 February 2004 in San Diego, California at the Bahia Hotel on Mission Bay. We are bringing together many of the most experienced and knowledgeable "bear" professionals in the world, including noted scientists, zookeepers, and naturalists representing a broad spectrum of institutions.

Information and online registration is now available on PBI's Web site [www.polarbearsinternational.org](http://www.polarbearsinternational.org) <<http://www.polarbearsinternational.org/>>. This includes the invited speaker list (which will be updated monthly) as well as the conference agenda, goals, scholarship information and other specifics. Any questions, please don't hesitate to call our headquarters at (225) 923-3114. Source: *Robert W. Buchanan, President, Polar Bears International, (813) 503-8887; robearbuck@aol.com*

## **Publication Explores Well-being of Animals in Zoological Research**

The Scientists Center for Animal Welfare (SCAW) has a new publication, *The Well-being of Animals in Zoo and Aquarium Sponsored Research*.

This publication incorporates the proceedings of a conference organized by the Scientists Center for Animal Welfare and co-sponsored with the American Veterinary Medical Association which was held in 1995 in New Orleans, LA. Some of the chapters in this 137 page book include: 1) Research and Welfare in Animal Exhibit Facilities; 2) How are Research Concerns Different in Zoos and Aquariums?; 3) Ethical Considerations for Conservation Research; 4) Trends in Environmental Enrichment in Zoos and Aquariums; 5) The Role of the Institutional Animal Care and Use Committee at Zoos and Aquariums; and 6) The Veterinarian's Role in Protocol Review at Zoos and Aquariums. The book can be purchased from SCAW for \$35.00. If you have any questions about this publication please contact SCAW at 301-345-3500 or [info@scaw.com](mailto:info@scaw.com)

### **Book Focuses on Veterinary Care of African Elephant**

*Veterinary Care of African Elephants* by JG du Toit - This manual is provided for information purposes in the interests of the conservation and management of elephants. The author, Kobus du Toit, is one of the pioneer wildlife veterinarians of Africa. He has specialized in the extensive capture, translocation and management of the large wild animals of Africa. He has supervised the capture and translocation of more than 400 elephant, which include the pioneering relocation of family groups of elephant to private nature reserves and game ranches.

The manual deals with: 1) Important information relating to the capture and transport of elephants. The information includes drug checklists, definition of age groups and dosage rates for transportation; 2) Management of elephants giving data on carrying capacities and densities on different veld types; 3) Elephant nutrition: metabolic requirements and gut anatomy, feeding in captivity and nutritional diseases in captivity; and 4) Diseases of elephants and veterinary treatment.

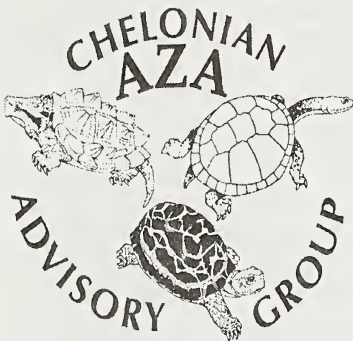
The manual is a must for anyone who has any dealings with elephants, rangers wishing to introduce elephants, zoos and as an information source for studies and research. Stocks are limited so order now. Price: R120 / US\$15 excluding postage. For more information on the book visit: <http://wildlifedecisionsupport.com/interact/smalls/427.html>

### **AAZK Website Has New Look - Check It Out!**

For those of you who haven't visited the AAZK, Inc. website recently you may want to stop by. It has a brand new look and new navigation which should make it easier to find your way around the site. There are also two new sections which have been added: the Animal Behavior Management Committee and Enrichment Committee both have informational sections on the new site. This is the first phase of the restructuring with more to come down the road. Any suggestions and/or comments are welcome. Again make sure you stop by to see the new and improved site at <http://www.aazk.org>.

### **T-Shirt Sale Benefits Chelonian TAG - A CORRECTION**

In the item on the Chelonian TAG T-shirt sales which appeared in the June *AKF*, there were two errors due to incorrect information being submitted. Please note that there is a s&h fee per shirt and that the incorrect zip code was listed in last month's announcement. The correct information is as follows: The Chelonian Advisory Group is offering T-shirts for sale. Shirts come in stonewashed blue, sage, white, and sand. The shirts have "ChAG" on the front, and the new ChAG logo on the back. The ChAG logo has an Alligator snapper, Mccord's snakesnake, and a Spider tortoise. Shirts are \$15.00 (plus \$2.00 s&h) and all profits go to Chelonian TAG projects. If you would like to order a T-shirt, send a check made out to **Tennessee Aquarium** to: Patti Shoemaker, CZ Houston Zoo Inc., 1513 N. Mac Gregor Houston, TX 77030-1603. Don't forget to include your name, complete mailing address, quantity desired, color choice(s), and shirt size(s) (S-XXL).



### **Renovation Information Needed Please!**

We are currently looking to enlarge, update and winterize our North American Beaver (*Castor canadensis*) exhibit. In addition, if anyone has any experience introducing new beaver to current inhabitants or suggestions in keeping same sex or different sex individuals, we would appreciate your input. I would be very grateful for any knowledge shared. Please contact: Jennifer A. Verstraete, Head Keeper of Mammals and Amphibians/Reptile Museum, Palasaides Interstate Park Commission, Trailside Museums/Zoo, Bear Mountain State Park, Bear Mountain, NY 10911-0427; phone - (845) 786-2701, ext. 278.

### **LA Chapter Supports AAZK Through Donation**

Many thanks to the members of the L.A. Zoo Chapter of AAZK for their recent donation of \$50.00 to the General Operating Fund of the Association.



# Wolf Notes

## USFWS Approves Seven Packs for WY

The USFWS has told Wyoming that its state wolf management plan will pass muster and allow delisting to move forward if it maintains seven wolf packs outside of Yellowstone and Grand Teton national parks says the *Casper Star-Tribune*, AP 5/25.

Currently, there are eight wolf packs outside of the parks, and the USFWS maintains that maintaining 15 packs statewide "would be adequate to ensure the viability of wolf populations in Wyoming in the foreseeable future." *Source: GREENlines Issue #1876 6-2-03*

## Wolf Killing in Wisconsin Resumes

In the past two week, four wolves in northwestern Wisconsin were legally trapped and killed, the result of recent down listing from endangered to threatened says the *Duluth News Tribune*, AP 5/29. The wolf shootings are the first in decades and end a policy where "problem wolves were trapped and relocated within the state." At least some members of the state's Natural Resources Board want the Dept. of Natural Resources "to prepare a report on what it would take to have the wolf listed as a fur-bearing species, paving the way for it to be hunted and trapped in Wisconsin." *Source: GREENlines Issue #1876 6-2-03*

## Mexican Gray Wolf Shot

For the first time, the USFWS has shot one the Mexican gray wolves in its reintroduction program for attacking cattle says the *Arizona Republic* 5/31. Only 19 Mexican gray wolves remain in eastern Arizona and New Mexico and the Center for Biological Diversity "blamed the shooting on the agency's willingness to placate ranchers" calling the killing symptomatic of "systematic mismanagement of the Mexican gray wolf reintroduction program." *Source: GREENlines Issue #1878 6-4-03*

## Wolf Growth Slowing in Idaho

The director of wolf recovery for the Nez Perce Tribe reports that the "spread of Idaho's wolf packs are beginning to slow down" because they "are running out of prime territory" and will "continue to slow or stabilize as the expanding population attempts to gain footholds in less desirable habitat closer to human populations" says the *Idaho Statesman* 6/8. In 2002, Idaho wolf packs produced an estimated 52 pups, an average 4.3 per pack, both numbers down from the year before, although the "number of documented packs rose by two to 19, and the population estimate increased from 261 in 2001 to 284 in 2002. *Source: GREENlines Issue #1883 6-11-03*

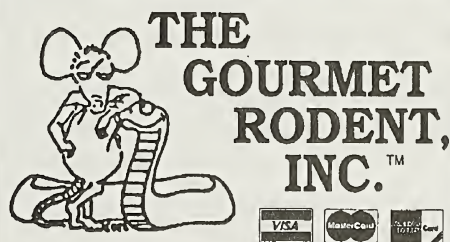
# AAZK Announces New Members

## New Professional Members

Ming Lee Prospero, Roger Williams Park Zoo (RI); June Bellizzi and Cindy McMaster, Catoctin Wildlife Preserve & Zoo (MD); Jan R. Cooper, ZooAmerica (PA); Crystal Matthews, Virginia Marine Science Museum (VA); Mindy Stinner, Conservators' Center, Inc. (NC); Jeremy Carpenter and Dan Nellis, Columbus Zoo & Aquarium (OH); Daniel Prutzman, Grizzly & Wolf Discovery Center (MT); Kristin Dvorak, Lincoln Park Zoo (IL); Keith K. Crow, Lee Richardson Zoo (KS); Alex Vasquez, Dallas Zoo (TX); Lisa Johnston, Moody Gardens Aquarium (TX); Brian Friess, Utah's Hogle Zoo (UT); Stacey Belhumeur, Reid Park Zoo (AZ); Tim McCaskie, Toronto Zoo (Ontario, Canada); Jodi Gienow, Muskoka Wildlife Centre (Ontario, Canada).

## Renewing Institutional Member

Perth Zoo  
South Perth, Australia



## RATS AND MICE

Bill & Marcia Brant

6115 SW 137th Ave., Archer, FL 32618

(352) 495-9024

FAX: (352) 495-9781

e-mail: GrmtRodent@aol.com

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# Coming Events

**2003 Animal Behavior Society's Annual Meeting**  
19-23 July 2003 at Boise State University in Boise, ID. For further information, see [www.animalbehavior.org/ABS/program](http://www.animalbehavior.org/ABS/program) or contact local hosts Jim Belthoff (jbeltho@boisestate.edu) or Al Dufty (aduffy@boisestate.edu).

**Invertebrates in Captivity Conference** - 30 July - 3 August 2003. Hosted by the Sonoran Arthropod Studies Institute, Tio Rico, AZ. Visit [www.sasionline.org](http://www.sasionline.org) or call (520) 883-3945.

**American Federation of Aviculture, Inc. 29th Annual Convention** - 6-9 August 2003 in San Antonio, TX. National and international speakers, roundtables, workshops, exhibit hall, auctions, raffles and banquet. For more information visit [www.afa.birds.org](http://www.afa.birds.org) or call the AFA office at (816) 421-2473 or email [afaoffice@aol.com](mailto:afaoffice@aol.com).

**Association of Avian Veterinarians 24th Annual Conference & Expo** - 25-29 August 2003 in Pittsburgh, PA. To view the entire program and to register on the web, visit [www.conferenceoffice.com/AAV](http://www.conferenceoffice.com/AAV). To contact the AAV Conference Office, email [AAV@conferenceoffice.com](mailto:AAV@conferenceoffice.com); phone (303) 756-8380; fax (303) 759-8861.

**American Zoo and Aquarium Association (AZA) Annual Conference** - 7 - 11 September 2003 in Columbus, OH. Hosted by Columbus Zoo and Aquarium. For more information contact Patty Peters: e-mail [ppeters@colszoo.org](mailto:ppeters@colszoo.org)

**2003 AZAD Annual Conference** - 9-14 September 2003. Hosted by Omaha's Henry Doorly Zoo, Omaha, NE. Interested parties may contact Judy Sorensen at 10969 North Lakeshore Dr., Blair, NE 68008 or by email at [howard@infinity.com](mailto:howard@infinity.com)

**2003 Association of Zoological Horticulture** - 13-18 September 2003. Hosted by Toledo Zoo. For more information contact Alan Donges at (419) 385-5721 ext. 2149 or email [greenhouse@toledozoo.org](mailto:greenhouse@toledozoo.org)

**ChimpanZoo Annual Conference** - 19-21 September 2003 in Sacramento, CA. Theme for the 2002 ChimpanZoo Conference is "A Closer Look at Chimpanzee Play". In conjunction with the Sacramento Zoo; includes presentations, special events, and a public lecture by Dr. Jane Goodall. Other special guest speakers include: Penny Patterson, Ph.D., Robert W. Shumaker, Ph.D., Lyn Miles, Ph.D. and Cristina Ellis. Conference information at <http://chimpanzoo.arizona.edu/Conference/2002/2002.html>

**The Aquarium and Zoo Facilities Association** - 21-24 September 2003, hosted by the Philadelphia Zoo. For info visit [www.azfa.org](http://www.azfa.org) or contact Matt Suydam at (215) 243-5355 or fax (215) 243-5391.

**30th National AAZK Conference** - 26-30 September, 2003. Hosted by the Greater Cleveland AAZK Chapter and Cleveland Metroparks Zoo. Watch for further information in upcoming issues of *AKF*. Registration and Hotel Forms may be found in April issue and will appear again in the July *AKF*.

**Zoological Registrars Association (ZRA) 2003 Conference** - 2-4 October 2003, hosted by the Brookfield Zoo. For info visit [www.zra.homestead.com](http://www.zra.homestead.com) or contact Debbie Johnson (708) 485-0263 ext. 460; email [dejohnso@brookfieldzoo.org](mailto:dejohnso@brookfieldzoo.org) or contact Pam Krentz at [pak@clevelandmetroparks.com](mailto:pak@clevelandmetroparks.com)

**Elephant Managers Association Conference** - October 2-5, 2003 - Hosted by Knoxville Zoological Gardens, Knoxville, TN. For more information, call (865)-637-5331, ext. 359 or e-mail [bhargis@knoxville-zoo.org](mailto:bhargis@knoxville-zoo.org)

**First International Conference on Zookeeping in 2003** - The Netherlands - Will be held between 2-10 October at Birdpark Avifauna. For further information please visit: [www.iczoo.org](http://www.iczoo.org)

**American Association of Zoo Veterinarians** - 5-9 October, 2003 in Minneapolis, MN. For additional information, visit the AAZV website at [www.aazv.org](http://www.aazv.org) or contact Wilbur Amand, VMD, Executive Director/AAZV, 6 North Pennell Rd., Media, PA 19063; Phone (610) 892-4812; Fax (610) 892-4813; email [AAZV@aol.com](mailto:AAZV@aol.com)

**The Sixth International Conference on Environmental Enrichment** - 2-7 November 2003 in Johannesburg Zoo, South Africa. Sixth International Conference on Environmental Enrichment in Johannesburg Zoo, South Africa. Hosted by the Johannesburg Zoo. For more information on the conference, including fees, registration facilities, reduced flights and pre- and post-conference tours, please go to [www.jhbzoo.org.za](http://www.jhbzoo.org.za) or contact Mathew van Lierop at [mathew@jhbzoo.org.za](mailto:mathew@jhbzoo.org.za) or on +83 600 2677.

**ACVP/ASVCP 2003 Concurrent Annual Meeting** - American College of Veterinary Pathologists and American Society of Veterinary Clinical Pathology joint meeting - 15-19 November, 2003 in Banff, Alberta, Canada. For more info contact ACVP at: Phone - (608) 833-8725 ext. 145; Fax - (608) 831-5485; email - [meetings@acvp.org](mailto:meetings@acvp.org); web - [www.acvp.org/meeting/](http://www.acvp.org/meeting/)

**Post Your Coming Event Here - email to [akfeditor@zk.kscoxmail.com](mailto:akfeditor@zk.kscoxmail.com)**



# From the President.....

It feels like I just got done with the mid-year Board meeting and now I am planning for the National Conference. You should be, too. The Cleveland folks have been working very hard to make this a top-notch conference. After reading their report at mid-year I am really excited about their plans. I encourage everyone to make plans to attend your National Conference themed "Strange Situations... Wild Occupations." All the registration forms you'll need may be found in the insert in this issue of *AKF*.

We are going to try some new things and hopefully they will make it an even better experience. First off is the change of days the conference is held (Sept. 26-30 - Friday through Tuesday rather than the traditional Sunday through Thursday). This allows for that all-important Saturday night stay to keep airfare low. We are also going to change the committee meeting day around a bit. The committee meetings will be Friday, September 26<sup>th</sup>. The morning meetings will be for the committees to use for work time. In the afternoon they will be meeting to discuss what has been happening, where they are going, and talk with interested members about their work. I hope this will give everyone the opportunity to get a better of idea of the work these committees do and an opportunity to become more involved on the national level. It is very rewarding work indeed. Here is the tentative schedule. Plan your conference time to begin on Friday morning.

Friday September 26<sup>th</sup>

8am-12pm, Committee Working Groups

10am-12pm, Conference Committee meeting

12pm-1pm, LUNCH

1pm-2pm, Professional Development meeting

2pm-3pm, Animal Behavior Management Committee meeting

3pm-4pm, International Outreach Committee meeting

4pm-5pm, Enrichment Committee meeting

Speaking of conferences, has everyone made plans to attend the first ever International Congress of Zoo Keeping? This promises to be another excellent opportunity for all keepers. This will be October 3-7, 2003 in The Netherlands. I am booking my flights to leave Cleveland direct for The Netherlands. Will you be joining me? Go to [www.iczoo.org](http://www.iczoo.org) for more information. See you there.

I have one last thing on conferences. In an effort to improve the benefits to our membership and foster the exchange of information, we have made an agreement with the Animal Behavior Management Alliance (ABMA) for reciprocal member rates at conferences. This means that as an AAZK member you can attend their conferences at their membership rates. Their members may do the same to our conferences. We hope that more organizations will join us in this practice and make the entire profession a more closely knit group for the betterment of all. Thanks for listening and remember to take care of yourselves as you care for your animals.



Kevin R. Shelton, AAZK President  
The Florida Aquarium  
Tampa, FL





# AAZK Book Sale

Sale price is 20% off the Suggested Price  
Previous books may still be available, with some price increases

<u>Sugg. \$</u>	<u>Sale \$</u>	<u>Item Title/Description</u>
\$49.95	\$39.96	<u>Long-Legged Wading Birds of the North American Wetlands</u> - Mark Riegner. Stunning photography combined with scientific knowledge makes this a beautiful and informative study of these magnificent birds. 208 pages, hardcover.
\$25.00	\$20.00	<u>National Geographic's Guide to Wildlife Watching</u> - Glen Martin. 100 of the best places in America to see animals in their natural habitats. 352 pages, paper.
\$16.95	\$13.56	<u>The Naturalist's Garden, Third Edition</u> - Ruth Shaw Ernst. This handy guide shows you how to turn your yard into one that will attract wildlife. 288 pages, paper.
\$29.95	\$23.96	<u>American Bison</u> - Dale F. Lott. This book is written by a behavioral ecologist who has studied bison for many years. He takes us on a journey into the past and shares compelling vision for this animal's future. 230 pages, hardcover.
\$16.95	\$13.56	<u>Beavers: Where Waters Run</u> - Paul Strong. A comprehensive profile of nature's most industrious architect. 144 pages, paper.
\$40.00	\$32.00	<u>Creatures of the Deep</u> - Erich Hoyt. A riveting story of the discovery of the sea's "monsters" and their world. 160 pages, hardcover.
\$12.95	\$10.36	<u>Backyard Bugs</u> - Robin Kittrell Laughlin. Open your eyes to the world of amazing creatures who live in your own backyard. 76 pages, hardcover.

**To Order:** List the items you are ordering along with your name and complete mailing address. Include a shipping fee of \$3 for the first item and \$2 for each additional item. Check payable to: "AAZK Book Sales" (**US FUNDS ONLY - NO CASH OR COD's please**). Sorry we cannot process credit card orders.

**Call or fax for shipping fees when ordering from outside the continental United States before sending any money.** We will work to find the best form of shipment.

**Mail requests to:** AAZK Beardsley Zoo Chapter, attn.: Linda Tomas, 1875 Noble Ave., Bridgeport, CT 06610-1600 Phone: 203-394-6563 **Fax:** 203-394-6566 **E-mail:** ltomas@beardsleyzoo.org

**FORBIDDEN UNDER THE TALIBAN!**

# KEEPER PROFILES

**"Hilarious!...First rate!"**

**—Christine, Deer Park Zoo**

**"It really rocks!"**

**—Mark Irwin DVM, Living World Museum, N.Y.**

**"One of our keepers laughed so hard that she slowly slipped beneath a conference table while making scary wheezing noises!"**

**—Julie Batty, Memphis Zoo**

**"Eric Cole is my drag queen hero!"**

**—Gretchen Zeigler, Sequoia Park Zoo, CA**

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# REACTIONS

## *A Question and Answer Forum for the Zoo Professional on Crisis Management*

*By William K. Baker, Jr., Curator  
Little Rock Zoo, Little Rock, AR*

### **Question**

We are putting together an emergency tool kit and are looking for specific suggestions. What would you stock it with?

### **Comments**

Typically there are two types of tools kits for use by Emergency Response Teams. One, the kit that goes in with the Fabrication Equipment that enables staff members to respond to emergency repairs like those that occur after a natural disaster such as a tornado, hurricane, or earthquake. Two, the portable kit used by ERT members on the go for emergency or after-hours repairs. This would be the kit that could actually be taken during an escape situation for containment repairs or a similar scenario.

The fabrication type of tool kit usually could best be identified as a master set in a large rolling cabinet or job-site style toolbox. Either way, the only limiting factor is how much money you have available to spend. Ideally, the more you can spend, the better off you and the facility will be when the need arises. I recommend a lifetime guarantee brand such as Craftsman™, Kobalt™, Snap-On™, or any of the other brands that are popular with mechanics. Each set should have the full range of tools including wrenches, ratchets, screwdrivers, nut drivers, pliers, hammers, hex and Allen wrenches, and saws. Focus on tools that don't require AC power to function.

The second type of tool kit is the one that isn't seen all that often in use by Emergency Response Teams in zoological facilities. Whoever puts this type of kit together faces the difficult challenge of developing something that is portable while anticipating every obstacle. Portable and bring everything, yes, definitely a challenge. This style is the one on which I will focus. While what follows is not a complete list it is a good starting point and can be easily modified.

### **ERT Portable Tool Kit**

Screwdriver set with interchangeable bits, (flat, Phillips, and hex)

Adjustable wrench, (crescent style)

Channel-lock pliers, (tongue and groove style)

Allen wrench set

Small claw hammer

Standard pliers

Needle nose pliers  
Linesman pliers  
Box-end wrenches  
Micro screwdriver set  
Electric wire strippers  
Voltmeter  
Fuses  
Electrical tape  
Small rubber mallet  
Drive socket set, [1/4" size with a 12-point set, (metric or standard)]  
Socket extender set  
Plastic zip-ties in multiple sizes  
Duct tape  
Measuring tape

This is not a complete list but in my experience it provides a good starting point. Aquariums will require special-needs equipment for underwater repairs and their kits should reflect the difference. Hazardous environments may require brass or non-striking style tools to use in the kits instead of forged steel.

Also, I always try to use flashlights with approvals for hazardous locations. Examples of these ratings would include Factory Mutual, Canadian Standards, UL, CE, and Mine Safety Health Administration markings. In essence, these markings mean that they have been approved safe for hazardous industrial uses, up to and including Class 1 and Division 1 environments. The best example in my experience is the ones from Pelican Products™. They are also rated for dive operations.

A couple of closing thoughts. I have found that if you look hard in a major auto parts store or discount store auto department, you can locate this portable type of tool kit in a hard plastic case. Something else to consider is purchasing a set of rechargeable power tools. These are absolutely invaluable with the Fabrication Equipment style tool kits and can easily be recharged from a portable generator.

**Next Month:** Can aquariums have crisis events?

**If you would like to submit a question for this column or have comments on previously published materials, please send them to AAZK, Inc., 3601 S.W. 29th St., Suite 133, Topeka, KS 66614  
Attn: Reactions/AKF**

(About the Author: Since 1985 Bill has been active in the fields of science, zoology, and wildlife management. His education and experience include a B.S. in wildlife management and post-graduate studies in zoology, Lab and Museum Assistant, Shoot Team Leader, ERT Member, Large Mammal Keeper, Senior Keeper, and Zoo Curator at various zoological facilities. His area of research is crisis management in zoological institutions, which draws upon practical experience and training as a Rescue Diver, Hunter Safety Instructor, NRA Firearms Instructor, and Red Cross CPR/First Aid Instructor.)

# The Water Column

By

*Dan Conklin, Senior Biologist, Florida Aquarium  
Bruce Elkins, Curator of Waters, Indianapolis Zoo  
Kevin Shelton, Associate Curator, Florida Aquarium*

## **Algae Control in Aquariums: Methods, Mechanisms, and Madness**

Algae is undoubtedly one of the most irritating problems for successful aquarists. Just when you think you have all your problems licked... Bang... up comes an algae bloom. So how do you get rid of this problem once and for all?

After fifteen years, I have learned you never get rid of it once and for all. Now, don't despair! You can get control of algae, but you will have to be flexible with your methods since an aquarium is a living system and constantly changing. The control method you use will depend on the type of system (seawater, freshwater, fish only, mixed fish and invert, pond, pool, flow through tank vs. closed system, etc), the type of algae (green, blue green or red slime -which is not an algae but a cyanobacteria, filamentous, or single celled free floating), expense and effort.

First a few common sense rules for algae control -

Algae like all living things need nutrients to grow. One of the main sources for these nutrients is the normal feeds used for fish and invertebrates. If you are having algae problems double check your feedings and water changes. Frequently an algae bloom is caused by excessive food leftover or is a sign it is time for a water change and hydrocleaning. Also, watch your dissolved organics. Dissolved organics are another main nutrient source for algae. If you have organic buildup problems add a protein skimmer and double check your feedings, again. A final source for nutrients is your make up water. High phosphates (a big algae fertilizer) are often found in freshwater supplies. Phosphates can also wash out of activated carbon used in aquariums. Make sure to check that your carbon is phosphate free.

I want to break down algae control into three main types:

1. Biological control- those wonderful little creatures that make algae their diet.
2. Mechanical control- physical removal of problem algae.
3. Chemical control- either adding or remove chemical species to inhibit algae growth.

There is a lot of overlap between these methods and some methods will cover more than one category but it gives us an organization for this article. Also, while I am referring mainly to algae control in aquariums, I will touch on a couple of methods that are used for larger ponds as well.

### **Biological Controls**

There are numerous animals that normally make algae their diet. Snails, shrimps, crabs, limpets, and various fish can all be used as algae eaters. Since there is such a wide variety you can find one that will fit your system. Biological controls are best since they are a natural method, which will help bring your tank to a natural equilibrium without endangering the other life you are trying to keep. I do recommend some thought before purchasing any of them though. First, learn something



about the animals you are acquiring. Plecostomus are often sold as wonderful algae eaters, which they can be, but they also grow to over a foot in length and are not very comfortable in a 20-gallon tank. Secondly, make sure the animal you purchase will eat the algae type you wish to control. Almost no animal offered as an algae eater will eat cyanobacteria. I have seen one hermit crab (*Clibanarius digueti*) listed as eating cyanobacteria, but otherwise you will have to find another method. Third, make sure you are not overfeeding a tank. Not only will this add nutrients that promote algae growth, but your algae eater may prefer leftovers. Snails are offered as one of the best algae eaters, but they are often more interested in the uneaten food than the algae you want them to eat. Finally, make sure you have enough animals to control the level of algae growth. Generally, it will take more animals than you think. I don't offer any suggestions here since it really is system dependent.

### **Mechanical Controls**

The simplest mechanical control is hydrocleaning or siphoning. This works well to remove cyanobacteria and algae in the substrate but not for hair or brush algae. For those you will have to resort to scrubbing. A second method is the algae scrubber. An algae scrubber is a container attached to the filtration system but separate from the main tank in which algae is encouraged to grow. Yes I said "encouraged". The algae growing in this separate container will use up nutrients from the rest of the system, which reduces the algae growth in the main tank. In turn, the algae can be periodically removed from the scrubber to promote new growth there. Most algae scrubbers are designed with removable plates to facilitate cleaning. Algae growth is encouraged by increasing the light level and aeration in the scrubber as compared to the main tank. Free floating algae (green water) can generally be controlled by increasing your filtration turnover or adding UV sterilization to your system. The final method of mechanical control I wish to address is reducing the light levels. Reducing the lighting levels will naturally reduce the ability of the algae to grow since they need photosynthesis to supply energy. Of course, this will not work for a reef system where intense light levels a necessary for coral and coralline algae growth.

### **Chemical Controls**

This seems to be the first effort most people jump to when algae becomes a problem and it really should be one of the last. Most chemicals for controlling algae are also harmful to the other plants and animals as well as the biological filtration. It is a matter of how harmful. Copper sulfate has been used for years as an algaecide in aquaculture, and it is also used as a parasiticide in the aquarium industry, but at high levels it is very toxic to fish. To complicate matters, copper sulfate is also very toxic to most invertebrates and some species of fish, even at low concentrations. Most commercial algaecides suffer the same problem. One chemical treatment that shows promise, especially for ponds, is barley straw. When barley straw is allowed to aerobically decompose in the pond water it produces a natural algaecide which has no effect on higher plants and animals. I recommend visiting the Aquatic Ecosystems website <http://www.aquaticceco.com> under "Tech Talks" for more information.

If you do chose to use chemical algae treatments, follow the instructions precisely and remember they work best to prevent algae growth rather than killing established growth.

A quick reminder: The authors of the Water Column are always willing to answer any questions you might have. They can be about filtration systems, water chemistry, or aquatic life. If we don't know, we will find out for you! We also welcome feedback from readers about previously published columns. Questions and comments may be submitted to us by email at:

Dan: [dconklin@flaquarium.org/](mailto:dconklin@flaquarium.org/)  
Kevin: [kshelton@flaquarium.org/](mailto:kshelton@flaquarium.org/)  
Bruce: [belkins@indyzoo.com/](mailto:belkins@indyzoo.com/)

Or by mail at: Kevin Shelton, The Florida Aquarium, 701 Channelside Drive, Tampa, FL 33602.

# Exotic Diseases - Part 2

## West Nile Virus

*(Editor's Note: The following is the second of a Three Part series on Exotic Diseases being reprinted here with permission from the author. It originally appeared in The Keeper, Spring 2003, the newsletter of the San Diego Chapter of AAZK. Look for Part 3 on Exotic Newcastle Disease in the August issues of AKF.)*

By Yvette M. Kemp, Sr. Mammal Keeper  
San Diego Zoo, San Diego, CA

It seems that in the last few years we have heard about more exotic diseases than we have in a long time. First it was the pyres of burning cattle carcasses from foot and mouth disease (FMD) in Europe, then it was West Nile disease on the east coast, now it's Newcastle disease in San Diego. It doesn't get any closer to home than that.

Since it is so close to home, there are precautions that we need to take to prevent the spread of Newcastle disease, and other diseases, into our work and, for many, into our homes. Learning about the diseases is a way of learning how to recognize their symptoms and how to prevent spreading them. The U.S. Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS) are responsible for protecting U.S. livestock and are the sources for most of the following information. Hopefully, by sharing this information with you it will assist us in the care and disease prevention of the animals we are responsible for. If you would like more information, just log onto [www.aphis.usda.gov](http://www.aphis.usda.gov), [www.cdffa.ca.gov](http://www.cdffa.ca.gov), and/ or [www.nwhc.usgs.gov](http://www.nwhc.usgs.gov). It is amazing to see the amount of information we have at our fingertips.

### WEST NILE VIRUS or DISEASE (WNV)

West Nile is a mosquito-borne virus which causes encephalitis, inflammation of the brain.

It has been found in Africa, western Asia, the Middle East, the Mediterranean region of Europe, and in 1999 it was first detected in the United States. In late summer of 1999, the National Veterinary Services Laboratories (NVSL) of the USDA's APHIS Department isolated a virus from nervous system tissues and other organs of birds (14 species were involved) from the Bronx Zoo and Queens Wildlife Center

and crows from the NY City area. Samples were sent to the U.S. Department of Health and Human Services Centers for Disease Control and Prevention (CDC) for identification. The CDC announced that the virus was similar to that of the West Nile virus, previously unseen in the Western Hemisphere. It was later confirmed it as West Nile and connected it to an encephalitis outbreak, initially attributed to another mosquito-borne flavivirus called St. Louis encephalitis (SLE) virus, that killed 7 people and infected at least 55 others in the NY City area in August through October of 1999. The virus has since then been identified in horses, mosquitoes, and wild birds in more than 44 states in the eastern U.S. and the District of Columbia.

Birds are the natural hosts for the virus, which can then pass to humans and other animals through bites of infected mosquitoes. Mosquitoes acquire the WNV from viremic birds and pass it on to other susceptible species which may include other birds, mammals, reptiles and humans. Horses and humans may become infected and develop clinical signs but are unlikely sources for disease transmission. Clinical signs of West Nile virus infection in horses include ataxia (stumbling and incoordination), depression or apprehension, weakness of limbs, partial paralysis, muscle twitching, or death. As of January 2003, the USDA's Veterinary Services Laboratories (NVSL) has confirmed 14,717 equine cases of illness caused by West Nile virus.

Migrating birds may play a role in spreading the disease and wild bird surveillance is being used for early detection of the virus. Crow samples are especially important because crows are highly sensitive to the virus. Crows can be sentinels for local transmission of the disease since they normally travel less than 200 miles and generally do not migrate. To date, the virus has affected over 110 species of birds. APHIS's Wildlife Services (WS) program collects wild birds to test for West Nile virus. They initially focused on east coast States but have expanded their efforts across the entire U.S. The U.S. Geological Survey (USGS) is also working with the CDC to learn the current geographic extent of WNV, to understand how it moves between birds, mosquitoes and humans, and to predict future movements of the virus.

APHIS's Veterinary Services (VS) considers situations where birds show neurological signs as having the potential for hosting a foreign animal disease. This allows NVSL to rule out



exotic poultry diseases, such as Newcastle and highly pathogenic avian influenza, before testing for West Nile.

No treatment is currently available for West Nile virus, however, VS is working to assist all companies interested in producing a vaccine. Most people who become infected with WNV will either have no symptoms or only mild ones. On rare occasions WNV results in severe or fatal illnesses. As of January 15, 2003, a total of 3,949 laboratory positive human cases have been

reported to the CDC, of which 254 cases resulted in deaths.

To decrease the chances of being exposed to the virus, you must decrease exposure to adult mosquitoes. The best way to do this is by removing any potential sources of water in which mosquitoes can lay their eggs and larvae can develop.

**Next Month: Exotic Newcastle Disease (END)**

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## Chapter News Notes

### Palm Beach AAZK Chapter

The following officers were elected in January:

President.....Michele Dzama  
Vice President.....Diane Kaye  
Secretary.....Mark McDonough  
Treasurer.....Melanie Young

The year 2002 was a busy one for us. We manned booths at several zoo events, selling buttons and animal masks. At our annual Bowling for Rhinos event we raised over \$1500.00.

We also published a cookbook, "Feeding Time", full of tasty treats for both people and animals. This was a big hit during the holiday season



### Galveston AAZK Chapter

The following are our officers for the Galveston Chapter for 2003:

President.....Diane Olsen  
Vice-President.....Cathy Zoller  
Treasurer.....Heather Leeson  
Secretary.....Regan Gipson

--Regan Gipson, Secretary

What's your Chapter been up to lately? Drop a line to Chapter News Notes and fill us in on your activities and projects, new officers, your fundraisers, etc. You may send as a Word attachment to the editor at [akfeditor@zk.kscoxmail.com](mailto:akfeditor@zk.kscoxmail.com)<

# Animal Floor Drain Safety

By Richard J. Elia—Animal Keeper

Lincoln Park Zoo, Chicago, IL

Many zoos have aging facilities. A case-in-point is Indian Boundary Zoo, which was recently scheduled to receive new animals, including goats and a cow. Located on Chicago's North Side, Indian Boundary Zoo dates back to 1890. It is jointly operated by Lincoln Park Zoo (which cares for the animals) and the Chicago Park District (which maintains the building and grounds). The zoo's brick barn and animal yards received modifications in the '50s, '60s, and '70s, but were never completely overhauled.

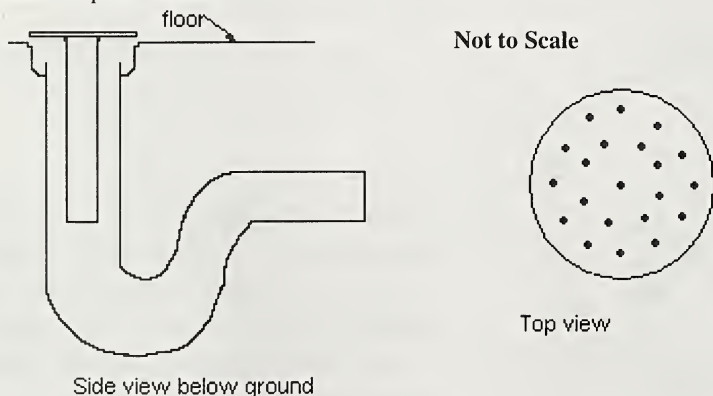
Updates were needed at Indian Boundary to properly house the new animals. The drains, for example, were pin-edged flip-top cover drains, with covers made of brass. Over time, the flip pins broke and the drain covers had become concave with the wear and weight of the animals. In addition, the edges of the drains and the drain covers had become rounded, allowing the covers to be easily dislodged by animals' hooves, creating a potential for injury.

The solution was to develop drain covers that could easily be removed by keepers and withstand abuse from animals (in particular, curious and active goats). I developed a steel-plate cover with a sheared edge and a piece of angle-iron (2 inches by 2 inches by 12 inches, 5.08cm by 5.08cm by 30.48cm) welded and centered to the underside. The weight of these covers, I figured, would prevent the animals from dislodging them from the drains.

To determine if such an item could be fabricated, I contacted Ray Frailey, an iron worker for the Chicago Park District. After studying the design, Frailey suggested that a piece of steel pipe would enhance design security.

The new steel-plate drain covers (7 inches in diameter, 1/4-inch thick, 17.78 cm diameter by .635cm thick) have a sheared edge. The drain covers have a series of 1/4-inch (.635cm) holes, the holes are arranged in two concentric circles (see diagram). The holes do not weaken the steel plates or the welding of the two pieces. Welded and centered to the bottom of each drain cover is 12 inches (30.48 cm) of 1 5/8-inch (3.12 cm) outside-diameter steel pipe (1/4-inch, .635 cm, regulation thickness). This diameter pipe allows for clearance around the inside of the drain pipe, while adding weight and stability to the cover. The new covers run from the top of the drains to within a few inches of the bottom, letting water flow freely out of the exhibit through the drains.

This new drain cover design is a meaningful improvement and has prolonged the use of the animal holding area at Indian Boundary Zoo. Created at no great cost, as part of routine maintenance, it eliminated the need to install a new drain system while improving animal safety and easing keepers' maintenance responsibilities.





# Flat Puppy Syndrome in Maned Wolves Corrected Through Physical Therapy

By  
*Patricia M. Mulnix, Veterinary Technician*  
and  
*Darren N. Colello, Animal Keeper*  
with  
*Dr. Marilyn M. Baeyens, DVM*  
*Little Rock Zoo, Little Rock, AR*

## Foreword

The Little Rock Zoo in Little Rock, AR has been exhibiting Maned Wolves (*Chrysocyon brachyurus*) since the early 1980's, and has one of the most successful breeding programs in North America. From 1993 to present, our total number of births was 17, with 12 surviving to adulthood. Currently, we exhibit two breeding pairs (one pair proven breeders, and the other pair just introduced) and the three juvenile males, featured in this article, that resulted from our most recent birth on 19 February 2002.

## Subjective/Objective Data

A three-week-old male maned wolf (*Chrysocyon brachyurus*) was presented to zoo veterinarian Dr. Marilyn Baeyens, DVM for examination. The puppy's left rear leg was hyperextended at the hock. Calluses were present on the dorsal surface of the foot and the pads of that foot were very soft from not having contacted the ground. Closer observation revealed that the other two puppies had similarly splayed forelimbs, and calluses on their elbows (see at left). All puppies had flattened chests and were unable to hold themselves off the ground or move about the den box normally. Their plight is not an uncommon one. It's called flat puppy syndrome. While it's cause is unknown, careful study of the puppies' birth environment revealed it to be a contributing factor.



The den box had been constructed of plywood with a tight-fitting, lid. Measurements of the box are 120cm x 120cm x 60cm (4ft x 4 ft x 2 ft). The substrate being used at the time of whelping was a finely shredded wood product called wood wool. Its use in the den box was a relatively new change; it had not been used during any of the pervious births. Over time, the wood wool (possibly in conjunction with excessively high temperatures in the den) had effectively sanded the plywood bottom of the den box making it virtually without traction.

Three male maned wolf pups at three weeks old. Notice the splayed limbs on all individuals. Top: "Corsair"; Middle: "Lycos"; Bottom: "Roan". (Photo by Debbie Thompson)

## Assessment

None of the puppies, with their undeveloped muscles, were able to get purchase in the box to stand. At three weeks, they should have already begun standing, perhaps even walking, but were barely able to scoot around on their bellies. Although their leg muscles were being developed, the muscles were strengthening in the wrong directions.

## Plan

The prescribed treatment from Dr. Baeyens consisted of two main strategies:

- 1) Provide traction in the den box.
- 2) Begin physical therapy.

### *Providing Traction*

In order to provide the necessary traction in the den box, the decision was first made to change substrates in both den boxes (in case the mother moved the puppies, which she eventually did) from wood wool to hay. The Maned Wolf Husbandry Manual does not encourage the use of hay in whelping boxes, due to the threat of inhaling potentially harmful particles such as dusts, molds, and pollens that could cause serious respiratory problems in neonates. We chose to use it, however, because the puppies were now old enough that such a pneumonia was no longer a large threat, and our zoo's hay quality exceeded that of our straw.

This substrate change seemed somewhat ineffective because the mother would push the hay out to the edges of the den box and no hay remained underneath the puppies to provide support and traction. We tried placing thick rubber mats that had been steam-sterilized in the boxes, with hay over the top. This worked better because even when the hay was pushed out to the sides, the mat remained in place. Another keeper in the area had concerns about the comfort of the mats in regards to the parents, and the mats were removed and finally replaced with squares of sod covered with hay. This naturalistic bedding provided enough traction for the puppies, was not rejected by the parents, and proved to be more than adequate for the main task at hand.

### *Physical Therapy*

Dr. Baeyens suggested that physical therapy should begin immediately. She recommended a consistent and daily routine as the best course of action. It was hoped that the exercises would strengthen the leg muscles, and enable the puppies to develop essential motor skills and improve their coordination. I was to carry out this part of the plan with the aid of one of the keepers in the area. To be totally honest, I was skeptical.

In order to comply with the Maned Wolf Species Survival Plan Manager's request to not hand-rear the puppies, Animal Keeper Darren Colello and I needed to devise a strategy that would allow us daily access to the puppies without removing them from their den or causing stress to the parents. Both adult wolves would habitually exit the den when a keeper entered to clean and feed, and would remain outside until the keeper had left. Using this routine to our advantage, Colello would enter the den at the regular cleaning/feeding time with me, and the parents would leave. The lid from one den box was removed and placed in front of the wolves' access door to prevent them from re-entering. This particular lid was used because it was made of clear Lexan®, framed in wood. This design allowed nervous parents the opportunity to look into the den and see the puppies were not in any obvious or immediate danger. The physical therapy would be performed after the den was cleaned, and once the session was over, the barrier in front of the doorway was removed. We "therapists" were often met with obligatory growls and whines from the puppies. Upon hearing these noises, the mother would sometimes return to the doorway and look in. She usually left satisfied that nothing was really wrong, but if she came by more than once or twice, the sessions were quickly finished. Both Colello and I rewarded the adults for allowing us access to the puppies for any length of time. The reinforcement used was animal crackers, plain and unfrosted.



While all three puppies needed to be exercised, the focus remained on one puppy, “Lycos” whose front legs were hyperextended at the shoulders. His sessions lasted, on average, seven to eight minutes. “Roan,” the puppy originally presented, was the largest physically and the most aggressive. He objected almost entirely to being handled at all. Therapy for him lasted two to three minutes. The third and smallest of the puppies, “Corsair,” seemed to need the least amount of exercise. Because his muscles were more undeveloped overall, he was able to right himself somewhat independently once the proper surroundings were procured. Physical therapy was still performed, but for very brief moments.

All therapy sessions were carried out within the den. I would lift each puppy out of the den box by holding the skin at the nape of his neck. Colello then held them with both hands supporting the full weight of the puppy, leaving the legs unrestrained.

The exercises consisted of the following movements:

“Roan”- forward flexion of the right tarsus (hock)

“Lycos” – forward rotation and adduction of both humero-scapular joints  
flexion and extension of the carpus (both legs)

“Corsair” – forward rotation and adduction of both humero-scapular joints

No specific number of repetitions was completed. The amount of activity was dependent on multiple factors including the amount of stress placed on the parents, the amount of stress on the puppies, and our availability. After the therapy had gone on for several days, we decided to discontinue for one day each week. This break in their new exercise routine gave their developing muscles some time to strengthen and repair. This also permitted a day free of extra interruptions for the parents.

Overall, the whole project lasted three weeks. During the first week, it seemed that very little progress was being made. The day-to-day changes were undetectable. The thought that the puppies may never be able to walk normally was disheartening to both Colello and me. But, into the second week, their leg muscles felt more pliable with each exercise. Both “Roan” and “Corsair” were making attempts to stand, even take a few steps, but it seemed “Lycos” was stagnating. I was convinced that what we were doing wouldn’t help him. He would never be able to stand or walk like his brothers had begun to do. By the beginning of the third week, however, optimism finally overtook me, and I realized just how far “Lycos” had come. His legs were still somewhat splayed, but where he held them in relation to his body was much closer to normal. When his paws were in my palms and I provided resistance, I could feel him pushing back. His leg muscles were definitely getting stronger.

Two days later, when Colello and I entered the den and removed the lid to the den box, “Roan” *ran* out of the box and hid behind it. “Corsair” *ran* to the other side of the den box, but didn’t leave. “Lycos” attempted to stand on his own. In another three days, “Lycos” did stand. He also took a few steps in the box with my hands supporting him. These developments were very exciting. The following day, they were examined again by Dr. Baeyens and received their first vaccinations. The positive changes and the acquired abilities of all three puppies were remarkable. Now even “Lycos” resisted the manipulation of his limbs. The therapy would be discontinued, and the puppies would be allowed to finish growing and developing independently.

As an added benefit, we were able to continue handling the puppies for the rest of their vaccination series without them losing their fear of humans.

## Conclusion

Flat puppy syndrome had never before been encountered at the Little Rock Zoo in any species, although it can affect most quadrupedal mammals. We feel it is our responsibility to make other institutions fully aware of this condition, as well as suggest preventative measures and offer ideas



for its treatment. Perhaps the most obvious prevention of this syndrome is the careful selection of a substrate that will not impede or compromise the traction in the whelping box, which in turn, could lead to developmental locomotor problems. We feel naturalistic bedding is best. Secondly, in areas with warm winters, it may be unnecessary to heat the dens. High temperatures could result in a decrease of traction if it causes excessive weathering and warping of wooden den boxes.

Treatment of this syndrome through physical therapy has, in this instance, been a remarkable success, once the problem was identified and the environmental conditions were corrected. We believe that even though the Maned Wolf Husbandry Manual discourages the hand rearing of pups, careful daily observations of the puppies is essential to ensure that they are growing and developing normally. "Hands-off" doesn't mean, "Don't look." If both parents are comfortable with their keepers, and will allow it, limited handling of the puppies may be attempted, but certainly not excluded altogether.



**The same three males at five months hiding in their favorite stick pile.**  
**Back: "Corsair"; Center: "Lycós"; Right: "Roan".** (Photo by Debbie Thompson)

### **Acknowledgements**

The authors would like to thank the following people for their professional criticism of this work and their continuing support of this species' survival: Melissa Rodden, Maned Wolf SSP Coordinator; Drs. Mitchell Bush and Robyn Barbiers, Maned Wolf SSP Veterinary Advisors; Deborah Thompson, Curator of Carnivores, Little Rock Zoo; William K. Baker, Jr., Curator of Hoofed Mammals, Little Rock Zoo.

### **About the Authors**

Patricia Mulnix has an AAS in Veterinary Technology from Parkland College in Champaign, IL. She has worked at the Little Rock Zoo in Little Rock, Arkansas since August 2001.

Darren Colello has been an animal keeper at the Little Rock Zoo since November 2001. He has worked in the zoo field for four years, including a keeper position at the Toronto Zoo in Ontario, Canada, and he holds degrees in Primatology and Animal Science.

Dr. Marilynn Baeyens, a graduate of Michigan State University's College of Veterinary Medicine, has been working with the Little Rock Zoo as their veterinarian for nearly 18 years, while also maintaining a full-time associate position for a private veterinary practice in North Little Rock, AR.

# CONFERENCE NOTES AND UPDATES

*“The countdown is on for Cleveland 2003!”*

## CLEVELAND CHALLENGE

Just a quick update and big “thank you” to those Chapters that have participated in our Cleveland Challenge. We have received \$4,000 so far from 15 Chapters. The deadline is **15 July 2003**, so get your donations in the mail.

## CONFERENCE SPEAKERS

We are lucky to have scheduled two wonderful speakers for the conference. Our keynote speaker is Michael Fay of the Wildlife Conservation Society. Our other speaker is Laurie Marker from the Cheetah Conservation Fund.

## POST CONFERENCE TRIP

October 1, 2003: Conference delegates will have dinner at The Foundry Aleworks in Pittsburgh, PA. Interested employees of National Aviary will join them there. Delegates will pay for their own dinner. Dinner prices range from approximately \$6 to \$20.

October 2, 2003: Conference delegates will visit National Aviary in the a.m., and receive a luncheon banquet provided by National Aviary before departing for the Pittsburgh Zoo. Cost for this trip is estimated at \$75-80 per person. See trip details on Pre/Post Trip Registration form in this insert.

Any questions about the pre and post trips e-mail Maureen Meslovich [momeslo@cs.com](mailto:momeslo@cs.com) or call (216) 661-6500.

## AIRLINE INFORMATION

The official airline is Continental. The discounts are 10% off Yand H fares and 5% off all other fares. The codes when booking your flights are UPMV4T for travel to Cleveland and VSCB5H for travel to Amsterdam.

## REGISTRATION FEES

Please note that there will be no refunds of registration fees two (2) weeks prior to the conference.

## AUCTION ITEMS

If you are bringing an auction item, it would be great if you could send it in early to: Heather Mock, 3900 Wildlife Way, Cleveland, OH 44109.

## QUESTIONS

We update our website as often as we can at [www.clemetzoo.com](http://www.clemetzoo.com). Or you could call (216) 661-6500 x4482. Please note the extension has been changed from the one published in the March *Forum*. When calling, please leave a brief explanation of your question and the best way to contact you during the day. As you well know keepers are never near the phone when it rings, and if you leave your question we can call you back with an immediate answer.



# SHERATON CLEVELAND CITY CENTRE HOTEL

777 St. Clair Avenue  
Cleveland, OH 44114  
216-771-7600 or 1-800-321-1090

Please call or mail your reservation information in order to reserve accommodations for:

**American Association of Zoo Keepers**

## RESERVATION FORM

**September 24, 2003 - October 3, 2003**

**You may confirm your room reservation by completing this form and mailing it to the address above or call our Reservations Department toll free at 1-800-321-1090**

\*Handicap equipped guestrooms available

\*Check-in time begins at 3:00 P.M. - check-out time is 12:00 Noon

\*Hotel overnight parking rates: attendees receive \$5.00 off prevailing rates, currently,  
\$15.00 FOR SELF PARK, PER DAY      \$15.00 - VALET PER DAY

### RATES

Single Occupancy: \$119.00

Double Occupancy: \$119.00

Plus Applicable Hotel Tax

**RATE WILL ONLY BE AVAILABLE THROUGH AUGUST 25, 2003**

### REQUESTED ROOM TYPE\*

\_\_\_\_\_ Smoking      \_\_\_\_\_ Non-Smoking  
\_\_\_\_\_ King Bed      \_\_\_\_\_ Double/Double Bed

\*The requested room type is not guaranteed on arrival.

### ARRIVAL/DEPARTURE INFORMATION

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_

ZIP \_\_\_\_\_ PHONE (\_\_\_\_\_) \_\_\_\_\_ - \_\_\_\_\_

ARRIVAL DATE \_\_\_\_\_ DEPARTURE DATE \_\_\_\_\_

PLEASE RESERVE \_\_\_\_\_ ROOMS (S) FOR \_\_\_\_\_ PERSON(S)

CREDIT CARD TYPE/NO \_\_\_\_\_ EXP. DATE \_\_\_\_\_

**We will NOT guarantee Guestroom availability if reservation is received after August 25, 2003**

**To guarantee your room, we will need a first night's deposit or credit card number.  
If you wish to cancel your reservation, you must contact us by 6:00 p.m. on the day of arrival  
or you will be charged for one night's stay.**



Strange Situations ..... Wild Occupations

2003 AAZK NATIONAL CONFERENCE  
CLEVELAND, OHIO  
SEPTEMBER 26-30, 2003



(Please type or print clearly)

Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State/ Province \_\_\_\_\_ Zip \_\_\_\_\_  
Institution \_\_\_\_\_  
Position/ Title \_\_\_\_\_ Local Chapter member? \_\_\_\_\_  
Email address \_\_\_\_\_  
Presenting a paper/ poster? \_\_\_\_\_ Bringing an auction item? \_\_\_\_\_  
T-shirt size M \_\_\_\_\_ L \_\_\_\_\_ XL \_\_\_\_\_ Vegetarian? \_\_\_\_\_

Registration Fees

Registration Deadline is 1 August 2003

AAZK Member	\$150.00	_____
AAZK Member's Spouse	\$150.00	_____
Non-Member	\$200.00	_____
Late Fee *per person *(After 1 Aug. 2003)	\$ 25.00	_____

Daily Rates

Fri 26 Sept (Icebreaker)	\$25.00	_____
Sat 27 Sept (papers, breakfast, breaks)	\$35.00	_____
Sun 28 Sept (papers, breakfast, breaks)	\$35.00	_____
Mon 29 Sept (zoo day, breakfast, lunch)	\$35.00	_____
Tues 30 Sept (papers, breakfast, lunch, breaks)	\$40.00	_____
Tues 30 Sept (banquet)	\$40.00	_____
<b>TOTAL Fee Enclosed</b>		\$ _____

Check enclosed \_\_\_\_\_ Please make checks/money orders payable (in U.S. funds) to: Cleveland AAZK  
I wish to pay by credit card (note that payment by credit card will not be processed until July 1):  
Master Card \_\_\_\_\_ Visa \_\_\_\_\_ Expiration Date: \_\_\_\_\_  
Card Number \_\_\_\_\_  
Name as it appears on card \_\_\_\_\_  
Signature \_\_\_\_\_  
Conference Registration Fee **does not** include the cost of Conference Proceedings

Send Registration Form and all fees to: Stephanie Poduska, AAZK Registration,  
Cleveland Metroparks Zoo, 3900 Wildlife Way, Cleveland, OH 44109.

2003 AAZK NATIONAL CONFERENCE  
CLEVELAND, OHIO  
SEPTEMBER 26 – 30, 2003

PRE AND POST TRIPS REGISTRATION  
(please print or type clearly)



Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State/Province \_\_\_\_\_ Zip \_\_\_\_\_

Institution \_\_\_\_\_

Email address \_\_\_\_\_

Pre-Conference Trip Sept. 25 – 26, 2003 \_\_\_\_\_

Cost: TBD

Post-Conference Trip Oct. 1 – 2, 2003 \_\_\_\_\_

Cost: TBD

**PRE-CONFERENCE TRIP** - September 25 – 26, 2003

The group will be leaving the Sheraton City Centre at 7:00 AM on September 25, 2003 traveling to the Detroit Zoo. We will be staying in Toledo, compliments of the Toledo Zoo. The group will return to the Sheraton City Centre approximately 5:00 PM on September 26, 2003. **Cost: Free but delegates will need to purchase one meal.**

**POST-CONFERENCE TRIP** - October 1 – 2, 2003

The group will be leaving the Sheraton City Centre 6:30 AM on October 1, 2003 traveling to the Ohio State Park for a day of whitewater rafting and enjoying the scenic highlands. We will then travel to the Pittsburgh Zoo and National Aviary. We will be returning approximately 8:00 PM on October 2, 2003. **Cost: \$75-80 per person.**

Any questions you can e-mail Maureen Meslovich  
at [momeslo@cs.com](mailto:momeslo@cs.com) or call (216) 661-6500

# Keepers and Behavioral Research: Fostering the Connection

By

*Sue Marguli, Behavioral Research Manager  
and*

*Tina Weber, Keeper, Hammil Family Play Zoo  
Brookfield Zoo, Brookfield, IL*

Few of us become keepers because we enjoy cleaning enclosures. We enter the profession because we are fascinated by the animals (usually their behavior), we are concerned about their welfare (both at the individual and species level), and we want to make some small contribution towards education, conservation, and the acquisition of knowledge. The reality of zookeeping, however, is such that much of a keeper's time is devoted to meeting the basic physical needs of the animals: feeding, cleaning, medicating. Not only is observing behavior one of the joys of zookeeping, but it can be just as valuable to maintaining animal well-being (and keeper job satisfaction) as any other aspect of the job.

It remains a challenge to fit systematic behavioral observation into an already-packed workday, but it is possible, as recent articles in *AKF* attest to (Platt et al, 2002). At Brookfield Zoo, we continue to try and develop creative ways to foster and support keeper research. These include replacing casual observation with systematic observation, recruiting volunteers, and modifying standard observation protocols. Here, we describe some of these efforts.

## Replacing casual observation with systematic observation

During the past year, Brookfield has been developing a computerized behavioral monitoring system. The system rests on two assumptions: first, keepers spend some amount of time each day observing their animals and recording their perceptions in keeper logs or similar note-keeping systems. Second, no one is better able to carefully observe animals than their keepers; they can readily identify individuals (sometimes a problem when volunteers are used), and readily recognize subtle behavioral changes. We have provided animal areas with palm-pilots and, with the keepers, developed species-specific behavioral ethograms. Keepers can then use the system to record in a standardized way, observations that had previously been made more casually. A specific exhibit or entire animal area can be scanned, usually in 15 minutes or less, and the behavior, location, and neighbors of each individual animal recorded. The palm-pilots are then synchronized to a networked computer, and the cumulative database that we have established allows for immediate results. Keepers can use the database to examine time budgets of individual animals, changes in behavior over time, neighbor associations, sex differences in behavior, and many other comparisons at the touch of a button. With a little additional computer training, the data can be used to address an endless stream of research and husbandry questions.

Although there was some trepidation about the technology when we initiated the program, keepers are now asking for the palm-pilots and are excited about the possibilities that this opens for them. We are currently using palm-pilots in eight animal areas, and hope to expand that this year.

## Recruiting volunteers

Because lack of keeper time is often the stumbling block to conducting behavioral research, we have nurtured a cadre of trained volunteers that we can call on as needed. This requires (1) formal training of volunteers, (2) work with keepers to identify individual animals and recognize specific behaviors, and (3) careful scheduling.



For any large-scale project, training typically involves scheduling each volunteer with a keeper or researcher to go over the protocol and animal id's. Volunteers are then asked to practice on their own until they are comfortable with the methodology. Finally, volunteers may be "tested" by conducting observer reliability observations (the volunteer observes simultaneously with an "approved" observer and the results are compared, or the volunteer is asked to observe a specific segment of videotape as a standard). Volunteers who are adept at one type of observation, or with one particular species, may not make the cut on another project. Because volunteers come from a number of sources (local high schools and universities, the zoo's docent pool, and the community), we can readily identify volunteers with an interest in a particular project, and the required skill level for that project. Nurturing and supporting such a group provides a ready source of volunteers when the need arises.

Depending on the scope of the project, a staff member or volunteer may be asked to serve as a scheduler and primary contact person for the project. For example, a crew of 18 volunteers was used during a year-long study of gorilla behavior following the introduction of a new silverback (Margulis, Whitham and Ogorzalek, 2001; in press), and over 40 volunteers were recruited during observations of a newborn dolphin calf. Even smaller projects require careful scheduling to ensure that observation coverage is available when required, and that observers are not scheduled at the same time. Scheduling can become a major headache when multiple projects are ongoing, and we have found that identifying individuals for each project, rather than one over-worked scheduler for all projects, is most effective.

#### Modifying standard observation protocols

Behavioral research is often associated with hours of observing animals for months or years. In fact, this is not necessarily the case. Observations of short duration, or over a very limited period of time, can be just as valuable to understanding behavior and addressing management concern as can intensive, long-term studies. We have found that modifying standard observation protocols can result in data that are just as valid as data collected in more standard ways. For example, rather than schedule observers at a specific time, we typically allot a time block (say, two hours) during which a scheduled observer conducts an observation of 15-30 minutes. This flexibility is helpful for volunteers, and critical for keepers. By evenly spacing these "time blocks" throughout the day, we obtain a representative sample of behavior. Such scheduling is appropriate for some types of observations, but not all. An alternative that we have begun using with success is to ask keepers to collect point observations throughout the day at irregular intervals. A standard point or instantaneous sampling regime (Altmann, 1974) for example, might involve recording behavior every minute for 30 minutes, or every 30 minutes for 12 hours. For some projects, keepers instead collect point samples throughout the day, as it fits into their schedule. Ideally, a sample would be collected *approximately* every 30-60 minutes, but in reality, there may be periods during the day in which several hours go by without a sample, and other periods with sampling every 30-45 minutes. Using such a method, we have gotten extremely reliable data on seasonal swimming patterns in brown bears. To further corroborate this approach, we have done some data re-sampling studies on dolphins (Pruett-Jones and Margulis, in prep.) and polar bears (Margulis, in prep). Preliminary findings suggest that reducing sampling frequency can yield findings that are indistinguishable from more frequent sampling regimes, or in which differences are readily explainable and therefore controllable.

#### Keepers and research

Utilizing one individual to "oversee" a project is both an efficient and effective way to handle multiple observers. A keeper can take on this role on several projects (as this keeper has for studies of polar bears, walrus, and white-cheeked gibbons). Taking on this responsibility may seem daunting at first, but it is actually quite manageable. Scheduling can be difficult but it can be done. Organization and knowing how to use available resources are key. One such resource is the wealth of people who are willing to give us their time. Making efficient use of the volunteers is both beneficial to the volunteer and the organization.

This requires identifying a good fit between research project and volunteer. Not only do you get a benefit from the personal growth of overseeing a project, but the institution grows, the volunteers gain insight and respect, and most importantly, the animals benefit.

A virtually universal characteristic of all zookeepers is to try and cram as much as possible into our day and for some, behavioral observation becomes "just another thing". In looking at the "big picture", if we make it as important as feeding the animals, knowing that it is something that *has* to be done everyday, it will get done. Much like anything extra, it is too easy to push it to the side and say "I'll get to it later." The information you can gain is that important. The investment is minimal and the benefits are so great. It can also become a stress reliever and a nice relaxing activity for some in which again, the effort is minimal but the contribution is priceless. Whether you are the one taking the data, typing it into a database, scheduling the volunteers, or training observers, all functions are important and they all make a contribution.

Finding creative ways to facilitate behavioral research has enabled Brookfield keepers to conduct independent research and participate in ongoing projects. Keepers have presented at conferences, co-authored papers, and published in journals. We view this as a way to enhance job satisfaction, improve animal well-being, and increase knowledge.

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### **Three Types of Data Transfer Forms Available from AAZK**

Just a reminder that three different types of data transfer forms are available to requesting institutions from AAZK at no charge. These forms are designed to be used whenever an animal is shipped from one facility to another so that important information on that animal can be passed on to the receiving keeper and veterinary staffs.

The following forms are available by contacting Barbara Manspeaker at 1-800-242-4519 (U.S.) and 1-800-468-1966 (Canada), or by emailing your request to [aazkoffice@zk.kscoxmail.com](mailto:aazkoffice@zk.kscoxmail.com)

- **Animal Data Transfer Form (ADTForm)** - includes information on diet, reproductive history, general medical history/physical conditions, and enclosure/maintenance data on animal(s) being shipped.
- **Enrichment Data Transfer Form (EDTForm)** - includes information on behavioral history, enrichment currently used and how implemented (food, exhibit, artificial, etc.), safety concerns for animal(s) being shipped.
- **Operant Conditioning Data Transfer Form (OCDTForm)** - includes general background information, training specifications, training schedule, behaviors trained and methods used for animal(s) being shipped.

These forms are provided free of charge as a professional courtesy of AAZK, Inc. We encourage all zoos, aquaria and other animal care facilities to adopt the use of these forms when shipping animals. We extend our thanks to the following institutions for assisting in the printing expenses for these forms: Columbus Zoo (ADTForm), Arizona-Sonora Desert Museum (EDTForm), and Disney's Animal Kingdom (OCDTForm).



American Association of  
Zoological Parks and Aquariums

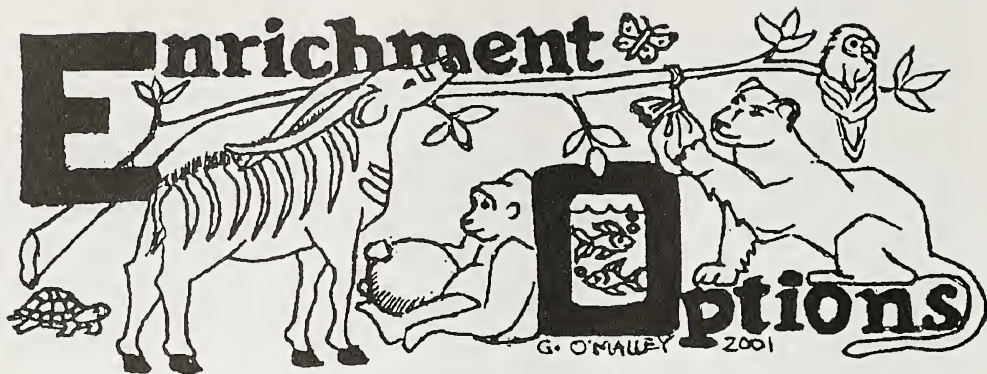
## **2004 AZA Regional Conferences**

Western Regional - 17-20 March 2004, Santa Barbara Zoo,  
Santa Barbara, CA

Central Regional - 31 March - 3 April 2004, Caldwell Zoo,  
Tyler, TX

Eastern Regional - 12-15 May 2004 Louisville Zoo,  
Louisville, KY





*EO Editors - Dawn Neptune, Utah's Hogle Zoo  
and Rachel Cantrell, Disney's Animal Kingdom*

## **Presenting Diet Items to Encourage Species-appropriate Behaviors A Behavioral Husbandry Resource Center Workshop - Part 1**

*Submitted by Angela Miller, Animal Keeper  
Disney's Animal Kingdom, P.O. Box 10,000  
Lake Buena Vista, FL 32830*

Several years ago, some of our hoofstock developed medical conditions that related to mineral absorption and consumption. In order to rule out items from the diet, all novel foods were removed and different grain formulas were tried for many of our animals. Unfortunately, our team had become fairly dependent on the novel foods for enrichment. The removal of these foods forced the team to think about new enrichment ideas that were not dependent only on novel food items. Some of the ideas that were generated included changing the presentation styles for regular diet food items, as well as for novel food items. The different presentation styles provided a wonderful opportunity to promote species-appropriate foraging behavior, even when providing the regular diet. The animals were surprisingly motivated to show species-appropriate behaviors even when only the standard diet items were used. Many times, standard diet items worked just as well as novel diet items to encourage the behaviors.

We have recently been able to provide novel foods to the hoofstock again, but this experience has forced us to think about the importance of presentation style when offering diet to any animal. Thus, the idea for an in-house workshop to share the idea of presentation styles and to develop new ideas for presenting diet items was born.

### **The Workshop**

**Purpose:** To gather ideas for presenting diet items (standard and novel) in a way that achieves the behavioral goals of enrichment for the animals in our care.

**Target Audience:** The in-house workshop targeted Disney's Animal Kingdom Animal Programs cast member including: Animal Keepers, Zoological Managers, Curators, the Animal Nutrition Center team and the Behavioral Husbandry team.

**Workshop Structure:** The workshop was organized by the Behavioral Husbandry Resource Center as one of their monthly events focusing on enrichment, training and/or animal welfare. The workshop was advertised via email and flyers. The workshop was informal and interactive, but had several learning objectives for each person in attendance. Each person was given a handout that listed the learning objectives, and that also provided the attendees with space for notes.



### **Learning Objectives:**

- To raise awareness and understanding about the importance of using variable presentation styles when offering diet items.
- For animal programs cast members to consider a presentation style that is consistent with the behavioral goals of enrichment when presenting diet items.
- For animal programs cast members to formulate at least two new ideas for unusual food presentation styles for an animal in their care.
- For animal programs cast members to share with the other attendees at least one food presentation style that they have used in their area.
- For the animal programs cast members to share the information they learned with those in their areas who were unable to attend.
- For animal programs cast members to understand the resources available to them to gather new ideas for food presentation styles.

### **Variable Presentation Styles and Behavioral Goals of Enrichment:**

In order to set the stage for the workshop, we discussed the importance of using variable presentation styles and how these styles should be consistent with the behavioral goals of enrichment. At Disney's Animal Kingdom, our enrichment philosophy is based around seeing enrichment as a process, not an object or an event. The goals of this process are to promote species appropriate behaviors, and provide animals with some choices and control within their environment (AZA/BAG 1999). To guide us through the enrichment process we follow an enrichment framework, which is made up of six components: Setting goals, Planning, Implementing, Documenting, Evaluating and Readjusting (Mellen & MacPhee 2001; Barber 2003). Since the first letters of these six components spell 'spider', our enrichment programs is referred to as the SPIDER framework. More information about this framework can be found at [www.animalenrichment.org](http://www.animalenrichment.org).

Setting goals is the first step of the process. Keepers answer a series of questions about the natural and individual histories of the animals, and identify species-appropriate behaviors they want to promote. For the purpose of this workshop, these species-appropriate behaviors to be encouraged revolved around the way animals look for and eat food, although it did not have to be limited only to these behaviors. Since the purpose of this workshop was to gather ideas for presenting diet items, this paper will focus on the setting goals part of the SPIDER framework. Once we identify behaviors we want to encourage and ideas for promoting these behaviors have been prioritized, the enrichment initiative goes through the remainder of the SPIDER framework (See Mellen and MacPhee 2001; Barber 2003).

Some of the behaviors that can be encouraged using different presentation styles of diet items are: exploration and investigation of the environment, foraging or hunting, food caching, locomotion, object manipulation, and play. These behavioral goals are by no means mutually exclusive. We also discussed the idea that some animals prefer earned food even in the presence of free food because it gives them more information and control of their environment (See 'Part II – Motivation, contrafreeloading and animal welfare: discussion points around diet presentation'. To be published in August 2003 *AKF*)

It is important to provide food enrichment in a presentation style that is consistent with the goal of the enrichment initiative and the natural history of the animal. For example, collared lemurs are arboreal forest dwellers (Nowak, 1991). If one of your behavioral goals for providing a puzzle feeder to collared lemurs is to promote foraging behaviors, placing the feeder on the ground may not achieve this goal. Attaching the puzzle feeder to a structure off the ground is more likely to encourage arboreal foraging, which is a naturalistic foraging behavior for this species.

Presentation style can also add variety to enrichment initiatives. If your initiative involves ice blocks, you can offer them the following ways with very different behavioral goals and responses: hung on a tree; hidden in a substrate (hay, wood wool, shavings, dirt, sand); placed on the ground; placed in a pool, drinker, or bowl of water; with food and/or an object frozen completely inside; with food and/or a object partially sticking out; or with an extract/perfume or spice.

**Sharing Food Presentation Styles:** By meeting in an informal workshop, each animal keeper who attended was able to share food presentation ideas with other keepers that work in different areas. Each keeper was also able to learn new ideas that could be shared with the rest of their team, sent

through the approval process (the Planning component of the SPIDER framework) and then implemented in their area. As with any enrichment initiative, documenting and evaluating the effectiveness of the enrichment (e.g., by seeing if it achieved its behavioral goal) is an important step in the enrichment process (Barber 2003). Participation from everyone in attendance made the workshop effective. Some of the presentation styles discussed were:

#### **Feeder devices:**

Ball puzzle feeder  
Bamboo puzzle feeder  
Barrel feeder  
Bin feeder  
Browse feeder  
Coconut feeder  
Insect dispenser  
Lexan puzzle feeder  
Log feeder  
Nectar feeder  
PVC feeder  
Pest-proof feeder  
Puzzle feeder  
Remote control feeder  
Stump feeder  
Time-release feeder

#### **Food placed in/on:**

Bowl (if this is not the usual)  
Cardboard box/roll/tube  
Ground/floor (if this is not the usual)  
Banana leaf or cornhusk burritos  
Fish stringer  
Food on a string  
Fruit kabobs/skewers  
Hang diet  
Smeared prop  
Cardboard egg carton or cricket dividers  
Paper bag  
Plastic container  
Pinecones  
Rolled rawhides  
Hidden in substrate (hay, wood wool, shavings, dirt, sand)  
Clothing (pockets)  
Pile (putting favored items under others)  
On top of mesh enclosure so item must be pulled through

#### **Preparation of food:**

Grated/shredded produce  
Whole produce  
Boiled  
Steamed  
Suspended in gelatin mold  
Frozen  
Desiccated/dried

#### **Delivery methods:**

In different enclosures (inside, on exhibit etc.)  
Live food  
Food toss  
Scatter diet  
Slingshot diet

#### **Water presentations:**

Diet mixed with water  
Produce in drinker  
Produce in pool  
Spiced water

#### **Browse/trees/logs:**

Flavored browse  
Fruiting branch  
Honey glazed browse  
PVC browse tube  
Scented browse  
Tree baiting

#### **Frozen presentations:**

Flavored ice  
Food/blood in ice  
Frozen produce  
Ice block  
Ice ring (with a hole in the middle)

**Eld's deer with rolling PVC puzzle feeder.**





### **Resources Available:**

At the workshop we discussed several resources that are available for gathering new ideas for food presentation styles. One of the resource locations at Disney's Animal Kingdom is the Behavioral Husbandry Resource Center (BHRC). The BHRC contains easily accessible, searchable and organized resources on enrichment, training and animal welfare in one convenient location (see Templeton and Miller, 2002). The resources available are pertinent magazines, journal articles and listserv discussions divided by topics and species. There are also books, videos and a computer. The Behavioral Husbandry Team is another resource for assistance with setting goals, planning, implementing, documenting, evaluating, and re-adjusting enrichment.

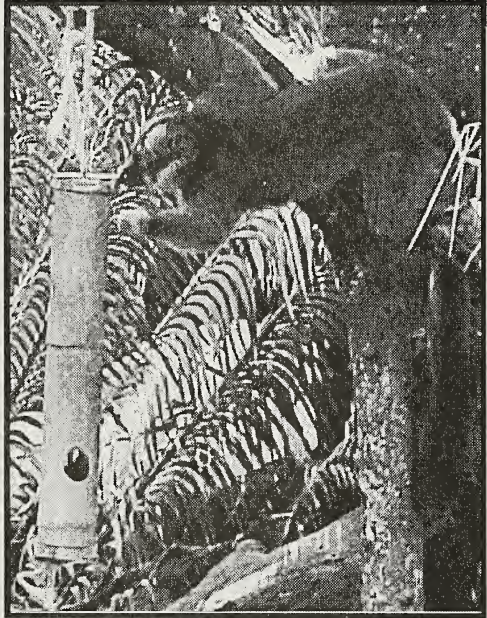
### **Conclusion**

The workshop lasted for one-hour and was well attended by a cross-section of animal keepers from various teams and members of the Behavioral Husbandry team. Everyone in attendance actively participated in the workshop. The learning objectives were met by all of those in attendance. The group discussed the importance of food presentation styles and finding a presentation style that meets the behavioral goals of enrichment. Everyone shared multiple ideas from their experiences and took away new ideas for the animals in their care. Several pertinent resources were available at the workshop for review. The workshop was followed up by a distribution of the meeting minutes highlighting the learning objectives and the discussions of the workshop. The information was also made available to those who were unable to attend.

### **References**

AZA/BAG (1999). Behaviour Advisory Group, a scientific advisory group of the American Zoo and Aquarium Association. Workshop at Disney's Animal Kingdom.

Barber, J.C.E. (2003). Making sense of enrichment and Auntie Joy's choice of presents. *Animal Keepers' Forum*, 30(3), 106-110.



**Collared lemur with a Bamboo Puzzle Feeder.**

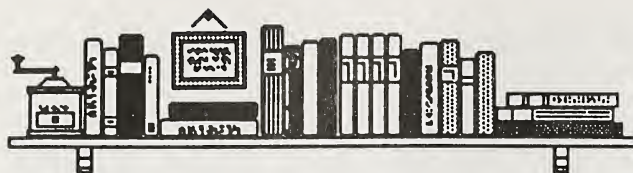
Mellen, J. and M. S. MacPhee (2001). Philosophy of environmental enrichment: past, present, and future. *Zoo Biology*, 20, 211-226.

Nowak, R.M. (1991). *Walker's Mammals of the World* (5<sup>th</sup> Ed.). John Hopkins University Press: Baltimore.

Templeton, M. & Miller, A. (2002). The Behavioral Husbandry Resource Center. *The Shape of Enrichment*, 11(3), 5-6.

*(Ideas appearing in this column have not necessarily been tested by the editors for safety considerations. Always think ahead and use good judgement when trying new ideas. You are invited to submit materials for the Enrichment Options Column. This might include recipes, toys, puzzle feeders, olfactory enrichment ideas, etc. Drawings and photos of enrichment are encouraged. Send to: AKF/Enrichment, 3601 S.W. 29th St., Suite 133, Topeka, KS 66614-2054. Eds.)*





# Book Review

## **Spirit of the Wild Dog: the world of wolves, coyotes, foxes, jackals and dingoes**

By Lesley J. Rogers and Gisela Kaplan

Copyright 2003, ISBN 1 86508 673 8

Allen & Unwin 83 Alexander St., Crows Nest NSW 2065 Australia

235 pgs. Paperback. \$24.95

*Review by Jim Knox, Zoo Educator*

*Connecticut's Beardsley Zoo, Bridgeport, CT*

*Spirit of the Wild Dog: the world of wolves, coyotes, foxes, jackals and dingoes* by Lesley J. Rogers and Gisela Kaplan provides a concise and alternative assessment of wild dog abilities, biology and status, the world over.

As a field researcher of neuroscience and animal behavior and a research professor of biological sciences and education respectively, Rogers and Kaplan present a qualified and highly-specialized portrayal of the world's wild dogs. Focusing their expertise on such characteristics as sensory abilities, social life, interrelatedness and intelligent behavior, the authors construct emerging profiles of complex carnivores that are detailed yet readily understandable to the lay reader.

The authors utilize an effective approach of illustrating scientific fact with anecdotal evidence. Regarding dholes, the authors cite the following: "Of all prey species, there appears to be a preference for sambars, very large ungulates of about four times the size of dholes. For this quarry, the dholes have devised the very special technique of attacking in the water, an environment where the strong sambar cannot utilize its hooves as a weapon. Dholes will also avoid making a kill close to their den. This is possibly so because in both national parks where dholes are protected (the Bandipur and Nagarole area in southern India) tigers and leopards share the same terrain and would no doubt be drawn to a kill and thus endanger the den, if it were too near."

Drawing upon their own research as well as that of others, Rogers and Kaplan cover additional chapters such as habitats of the wild dog, communication, sex and reproduction, hunting and domestic and feral dogs. Perhaps most importantly, they conclude with a chapter on the future of the wild dog.

The book's overall perspective is one of scientific explanation of these various chapter topics as contrasted by human activity and practices throughout the world. The mechanics of wild dog biology and natural history are laid out in a comprehensible way. Just as importantly, the corresponding human practices and policies are overlaid on this framework, yielding an illuminating perspective of the intersection of animal and human worlds. While the authors' intent is to acquaint their readers with the more subtle mechanics and interrelationship of wild canid biology, communication and intelligence, they persuasively view the body of their knowledge through the lens of animal behavior. They summarize this viewpoint accordingly.

"To an ethologist, these tragedies (animal/human deaths) described are all very predictable outcomes but, to this day, the importance of understanding animal behavior—a science in itself—is not fully appreciated or utilized in the overwhelming majority of conservation programs." This trait defines the book as an especially useful interpretive tool because it presents these wide-ranging topics in a common language.

As an educator and former keeper of canids, I find this book valuable in differentiating many fine points among wild dogs. Whether detailing social structure, hunting behavior or predator dynamics, this book goes into the kind of depth which establishes the uniqueness of these creatures. Although

a glut of wolf books flood the market, this is one of the very few that ably covers the other, “forgotten” canids such as Simien jackals, dingoes and New Guinea Singing dogs. The authors’ inclusion of a canid classification appendix is a nice feature in addition to a detailed selected reading list by chapter and index.

Unfortunately, the book’s retail price of \$24.95 is quite steep and may price it out of a welcome market of canid lovers. In spite of this, the book’s unique scope and potential as a reference source for select keepers, ethologists, advanced students and wildlife policy makers should ensure a loyal following. Overall, spirit of the Wild Dog is concise, current and informative and will nicely complement any collection of books on the subject of wolves, foxes and their kin.

## **Nigeria Returns Gorillas to Cameroon**

In late May, Nigeria repatriated two gorillas recovered from animal smugglers to eastern neighbor Cameroon, where they will be returned to their natural habitat in the Limbe Wild Life Park. The two species of western lowland gorillas (*Gorilla gorilla gorilla*) of central Africa’s tropical high forests were estimated to have been brought to Nigeria about seven years ago by animal smugglers intent on taking them out of the country.

Paul Raad, a Lebanese-born businessman who described himself as “an animal lover” said he bought the gorillas from the smugglers with the intent of returning them to the wild. In December last year the plight of the two gorillas, nicknamed Brighter and Twiggy, came to the attention of the Nigerian government, which subsequently speeded up the process to repatriate the primates. Funding for the translocation was provided by the United Nations Environment Programme (Unep).

Ian Redmond, an official of Unep’s Great Apes Survival Project, who was at the Lagos airport to see the primates off, described the repatriation as an important precedent to break the smuggling chain. “There is a well-trodden path of smuggling of apes from Cameroon,” he said. “The species are highly endangered and their numbers are declining year by year.”

Only 30,000 of the lowland gorillas are estimated to remain in Africa. In Nigeria, a species known as the Cross River gorilla is thought to number under 200. Nigeria’s outgoing Minister of State for Environment, Ime Okopido, said his government was seeking the assistance of United Nations primate experts to secure this population which is found in the country’s remaining rainforests in the southeast. Source: Excerpted from the *Mail & Guardian Online* 5/27/03

## **San Diego Zoo Field Researchers May Have Discovered Unknown Gorilla Subspecies**

Field researchers with the San Diego Zoological Society report they have discovered a population of gorillas in a remote forest of Cameroon which may be part of a previously unknown subspecies. Gorillas had not been previously reported in this particular area.

The troop was found by researchers Bethan J. Morgan and Chris Wild during a wildlife survey being conducted by the Society in an effort to establish a national park and ecological reserves in Bakossiland, a mountain region of Cameroon.

Morgan, who works with C.R.E.S. (Center for Reproduction of Endangered Species) and Wild, head of the C.R.E.S.’s Bakossiland field station, briefly sighted seven gorillas in the Ebo Forest while searching for drills (*Mandrillus leucophaeus*), the world’s largest monkeys.

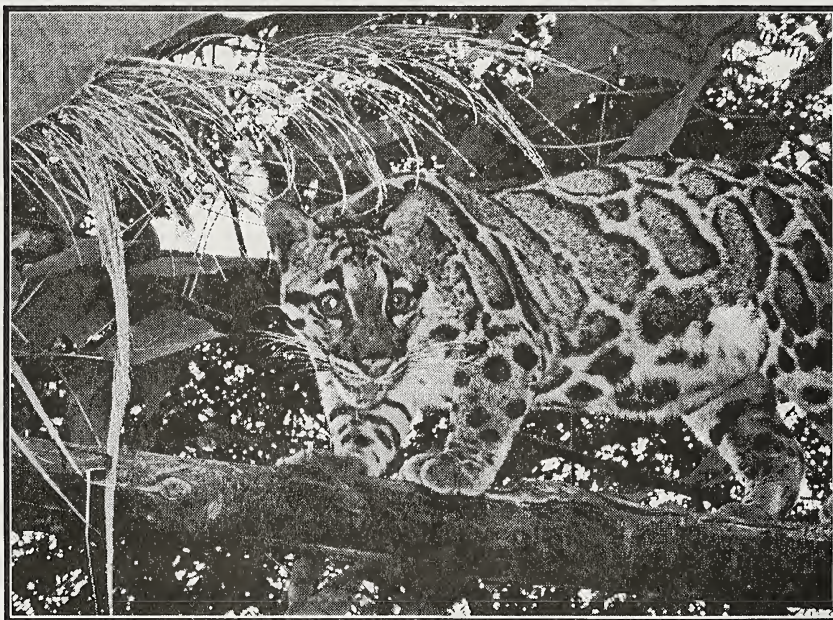
Society Director of Conservation and Science, Alan Dixson, said researchers will conduct genetic testing of hairs recovered from the gorillas’ nests to determine whether they are part of a previously undocumented gorilla subspecies. The researcher’s finding will be published in the *International Journal of Primatology*. Source: *Zoological Society of San Diego Press Release and AP Report* 5/21/03



## Thailand Clouded Leopard Conservation Program Summary

*Submitted by Pete Riger and Rick Schwartz, Nashville Zoo;  
Ken Lang and JoGayle Howard, Smithsonian National Zoological Park  
on behalf of the Thailand Clouded Leopard Consortium*

An initial request for support from the American Association of Zoo Keepers, Inc.'s "Zookeeper Grants in Research" was made in order to assist a collaborative Thailand Clouded Leopard Program between the Smithsonian National Zoological Park, Nashville Zoo and Thailand's Zoological Parks Organization (ZPO). This program initially encompassed the captive management and husbandry of the clouded leopard (*Neofelis nebulosa*) in a range country facility. Specific objectives of the program include: 1) renovate existing enclosures at Khao Kheow Open Zoo; 2) provide on-site animal manager; 3) provide training to Thai animal care staff in clouded leopard husbandry; 4) provide a nutritionally-balanced diet using new vitamin/mineral supplement developed and provided by Purina Mills; 5) move cats to newly renovated cages; 6) develop a recordkeeping system for daily animal care; 7) begin introduction between selected animals for breeding; and 8) cryopreserve sperm for assisted reproduction and storage of valuable genetic material in the Clouded Leopard Genome Resource Bank.



**Female clouded leopard "Gaint" born in 2000**

Other objectives, which were supported by the AAZK Grant, included fecal collection for hormonal analyses on the clouded leopards in the five ZPO facilities in Thailand. In addition, an agreement was made between the ZPO and the Fishing Cat SSP to include fishing cats in the program, and zoos collected fishing cat (*Pronailurus viverrinus*) fecal samples as well. The ZPO also maintains 2.1 marbled cats (*Pardofelis marmorata*) and these were collected opportunistically.

Fecal collections began in May 2002 and are ongoing. Two shipments of the collected material (approximately 8,000 fecal samples) have been sent from Thailand to the Smithsonian National Zoological Park. These samples continue to be collected daily from 28 clouded leopards and 10 fishing cats and will be utilized to determine the following:



1) Assessing changes in stress (measured as fecal cortisol) before and after the cats were moved from old enclosures and exhibits to new large isolated enclosures with tall cages. this study is being undertaken by Nadja Wielebnowski of the Brookfield Zoo.

2) Assessing female reproductive status and cyclicity using fecal hormone analyses of estrogen and progesterone metabolites. This study will be conducted by Katey Pelican and JoGayle Howard of the Smithsonian National Zoological Park.

3) Monitoring pregnancy, gestation, and parturition using fecal hormones.

4) Nutritional analyses before and after diet changes are made to the collection.

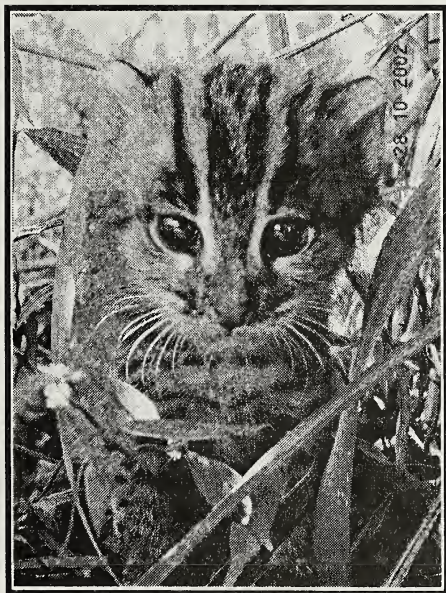
Initial success of the program include the program's first successful clouded leopard birth (1.1) in April 2003, documenting the benefits of improved diet, enclosure and husbandry. The parents of these two cubs are both donated, wild-caught animals and the cubs are currently being hand-raised. The parents had last reproduced in 1999 and were not successful in raising the cubs.



**1.1 clouded leopard kittens from the first litter born April 2003. Kittens are four weeks of age in this photo.**

Other accomplishments to date include:

- Importation of 2.2 fishing cat kittens to the AZA Fishing Cat SSP population. These represent the first set of new founders in many years.



**0.1 fishing cat "Ding" born in September 2002. She and her sister "Daao" currently reside at Omaha's Henry Doorly Zoo.**

- Relocation of clouded leopards in the Thailand zoos from small holding pens into new large enclosures at Khao Kheow Open Zoo.

- Development of a nutritionally complete diet which includes fresh quail and chicken with new vitamin/mineral supplement.

- Training of Khao Kheow Open Zoo staff member Nonglak Somranythin to assist in the management of the facility and the conservation program.

As we are just finishing the first year of the program, the Consortium will continue to build on these successes as well as strengthen the ties among international collaborators. Funding still is needed for cat diets, Thai animal care staff and video documentation of animal behavior.

# Legislative Update

Compiled by Georgann Johnston  
Legislative Advisor  
Sacramento, CA



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## Landowners Receive \$9.4 Million to Conserve Imperiled Species

Under the new Private Stewardship Grant program the U.S. Fish and Wildlife Service (USFWS) announced 113 grants totaling more than \$9.4 million to individuals and groups to undertake conservation projects on private lands in 43 states for endangered, threatened and other at-risk species. President Bush originally proposed the creation of the Private Stewardship Grant program during a speech in Lake Tahoe, Nevada in June 2000. The grants announced in May 2003, the first ever awarded under the program, will benefit species ranging from the whooping crane in Nebraska to the bald eagle in the state of Washington. Each grant must be matched by at least 10 percent of the total project cost either in non-federal dollars or in-kind contributions.

"Conservation, and especially the conservation of imperiled species, must be a partnership between the American people and their government," said Interior Secretary Gale A. Norton. "By making these grants, we are empowering citizens to restore habitat on their land and take other steps to protect and recover endangered, threatened and at-risk species."

"Judging from the number of truly innovative grant proposals we reviewed, landowners across the U.S. are eager to work with us to conserve at-risk species," said Service Director Steve Williams. "We anticipate this public/private partnership will result in significant conservation achievements for wildlife and wildlife habitat." The Private Stewardship Grants Program provides federal grants on a competitive basis to individuals and groups engaged in voluntary conservation efforts on private lands that benefit federally listed endangered or threatened species, candidate species or other at-risk species. Under this program, private landowners as well as groups working with private landowners are able to submit proposals directly to the Service for funding to support these efforts. President Bush has requested funding of \$10 million for this program in 2004.

This year grants were approved in the following states: Alabama, Alaska, Arizona, California, Florida, Kansas, Maryland, Mississippi, Nebraska, New York, Oregon and Washington. Some of the species covered in the grants include: gopher tortoise, Steller's and spectacled eiders, Chiricahua leopard frog, the Northern Aplomado falcon, brown pelican, white ibis, tri-colored heron, black skimmer, wood stork, roseate spoonbill, black-tailed prairie dog, the lesser prairie chicken, Arkansas River shiner and Arkansas darter (both fish), Delmarva fox squirrel, red-cockaded woodpecker, black pine snake, northern bobwhite, brown-headed nuthatch, Bachman's sparrow, prairie warbler, Henslow's sparrow, eastern diamondback rattlesnake, whooping cranes, threatened piping plovers, western meadowlark, chinook, bull trout, and coho salmon, as well as a number of species of butterflies and numerous endangered and threatened plant species. *Source: USFWS Press Release 28 May 2003*

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## Sweden Bans Experimentation on Most Apes

The Swedish National Board of Agriculture and National Board for Laboratory Animals have announced that they will ban the use of great apes and members of nine species of gibbons in laboratory experiments as of 6 June 2003. Only non-invasive behavioral studies of the animals will be permitted.

"No great apes or gibbon apes are currently used in experiments in Sweden, but the ban is still a matter of great ideological importance," said Animal Rights Sweden Campaign Manager Per-Anders Svard. "The decision marks an important shift in official policy, since it implicitly recognizes the individual moral worth of primates. Hopefully, the ban can be seen as a first step towards extending moral and legal rights to millions of other animals suffering in experiments."

Sweden follows two other European countries in this action. The government of the United Kingdom banned the use of great apes in laboratory experiments with the enactment of the Animal Procedures



Act in 1986. The government of the Netherlands has banned all use of chimpanzees in laboratory experiments except the employment of the animals in Hepatitis C research being conducted by the Biomedical Primate Research Center in Rijswijk. *Source: Animal News Center; Reporting the News from the World of Animals, 8 May 2003*

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### **Interior Department Provides New Guidance to Promote Development of Conservation Banks**

The U.S. Department of the Interior has issued the first comprehensive federal guidelines designed to promote the establishment of Conservation Banks, which ensure perpetual protection for endangered species that are adversely affected elsewhere. Assistant Secretary for Fish and Wildlife and Parks Craig Manson said: "This is a hallmark event in the 30-year history of the Endangered Species Act and a major step by the Fish and Wildlife Service to implement Secretary Norton's 'Four C's': conservation through cooperation, communication and consultation."

Conservation Banks were first authorized by the State of California in 1995. The banks are lands acquired by third parties, managed for specific endangered species and protected permanently by conservation easements. Banks may sell a fixed number of mitigation credits to developers to offset adverse effects on a species elsewhere. Traditionally, developers have been asked to preserve a portion of the area they are developing, a policy that can translate into scattered, small parcels of land. Conservation Banks provide for much larger acreage, where species protection is more effective as well as more efficient. Manson said there are more than three dozens such conservation banks now operating in a number of states, adding that they are becoming "an increasingly important" tool in mitigation.

When development is likely to harm threatened and endangered species or their habitat, the Service can authorize incidental take of these species, provided the developer prepares a conservation plan that minimizes and mitigates the damage. Conservation Banks have become an increasingly popular way to achieve that mitigation. Manson said the department's new guidance helps ensure that banks operate with consistency, providing both the Service and the bankers a common set of rules and directions and a higher level of market predictability and stability, all of which are fundamental to accelerating the development and use of banks to meet mitigation demand while providing mutual benefit for people and endangered species.

Craig Denisoff, vice president of the National Mitigation Banking Association, said the guidance will lead to the creation of many more conservation banks in the United States. "The California experience has shown that conservation banks provide the highest level of long-term protection for threatened and endangered species and have assisted in the implementation of recovery efforts," Denisoff added. Banking also presents opportunities for private landowners to get economic value for property with endangered species habitat. The guidance covers a dozen and a half areas of bank operations, including design and function of a conservation bank, definition of service areas in which they can operate, the relation of banks to species recovery plans, criteria for use of conservation banks, issuance of bank credits and the use of bank credits to meet mitigation requirements.

Examples of working Conservation Banks include:

Hickory Pass Ranch Conservation Bank, TX - In exchange for putting a conservation easement on their 3,000-acre ranch in the Texas Hill Country for the perpetual protection of the golden-cheeked warbler, the landowners received conservation credits from the Service that can be sold to businesses and local governments to mitigate impacts to the species.

Mobile County Gopher Tortoise Conservation Bank, AL - Habitat loss is the greatest threat to gopher tortoises in Mobile County, AL., which has experienced a 94% increase in residential development in the past several years. The Mobile County Bank set aside 222 acres for protection of the tortoise and its now rare habitat. It has proven to be the most cost-effective means to protect the tortoise.

East Plum Creek Conservation Bank, Colo. This bank is owned and operated by the Colorado Department of Transportation to provide for the permanent protection of the endangered Preble's meadow jumping mouse. The CDOT uses credits from the bank to mitigate for adverse impacts to mouse habitat resulting from highway construction and development projects on the central front range of Colorado. *Source: USFWS Press Release 8 May 2003*

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### **Ban on Imported Wildlife From Madagascar Lifted ... or Is It?**

On 9 May 2002, the USFWS announced a ban on importation of all wildlife from Madagascar based on the fact that the United States did not officially recognize any government in that country. Then, in September 2002, the United States officially recognized the government of President Ravalomanana. Therefore, on 20 September 2002, the Service issued a new notice to the CITES community stating that it would allow the importation of wildlife and wildlife parts from Madagascar if those imports were accompanied by documentation issued by Ravalomanana's government. Currently, importers are being required to obtain verified documents before clearance to enter the U.S. is granted and any items entering the U.S. are subject to detainment pending verification of the legality of the CITES documents and proof that they were actually issued by the Ravalomanana government's officials. *Source: CITES Update #85, April 2003 (published by USFWS)*

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### **Iceland to Resume Whaling**

The government of Iceland has announced that it is going to permit whalers to kill 250 whales, including 100 minke, 100 fin and 50 sei, each year beginning in 2006. Whaling has been previously banned in Icelandic waters since 1990. "The Icelandic market for whale products is very small," said Fisheries Minister Arni Matthiesen, "hence it is a precondition for any whaling around Iceland to be able to export whale products to the Japanese."

CITES, which Iceland rejoined in 2002, currently prohibits international trade in whale products. "We urge the government of Iceland to look to the future, which is quite clearly whale watching rather than whaling," said International Fund for Animal Welfare biologist Vassili Papastavrou. "Whales are simply worth more alive than dead." More than 60,000 individuals went whale watching from Iceland during 2002. *Source: Animal News Center, Reporting the News from the World of Animals, 12 May 2003*

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### **Extinction Imminent for Some Whales & Dolphins**

The World Conservation Union (IUCN) warns that some species of dolphins, such as baiji (Yangtze River dolphin) are "unlikely to last for another 10 years" and that "other small cetaceans and several great whale species are almost as endangered" says BBC News 5/14. Of the 86 recognized cetacean species, the vaquita (Gulf of California porpoise), northern right whale, blue whale, Hector's dolphin and Ganges/Indus river dolphins are critically endangered. *Source: GREENlines Issue #1868 5-20-03*

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### **Pet Passports for Ferrets**

The European Parliament has voted to allow pet passports to be issued for ferrets so that they, like cats, dogs, hamsters, rabbits and guinea pigs, can travel freely throughout Europe with their owners. Legislation creating pet passports, which actually are microchips embedded just underneath the skin of animals that provide proof of vaccination against rabies and other diseases, was enacted by the European Parliament approximately two years ago. Individuals traveling to countries in Europe previously would be required to place their pets in quarantine for as many as six months to ensure that diseases were not spread.

Issuance of passports for ferrets was not initially authorized because tests that could confirm the animals had been vaccinated were not available. The policy change was prompted by a campaign conducted by *Ferret World* and the Ferret Trust, an advocacy organization based in England. The activity of these interested parties caused the United Kingdom Department of Environment, Food and Rural Affairs Veterinary Laboratory Agency to concede the risk of rabies transmission was too insignificant to justify quarantining animals.

"It's great news," said the president of the Ferret Trust, "Now ferrets can take part in exhibitions and shows overseas for the first time. It wasn't fair to deny passports to ferrets but give them to cats and dogs." "The new law could have profound implications for the future of the breeding stock," said a Member of the European Parliament. *Source: Animal News Center, Reporting the News from the World of Animals, 3 June 2003*

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### **Brazilian Endangerment Doubles**

A new report has found that the number of endangered animal species in Brazil "nearly doubled" from 219 in 1989 to 398" says ENN, Reuters 5/27. Since only 200,000 of an estimated 2 million Brazilian species are known, the three year study did not focus on numbers of each endangered species but fast disappearing and threatened habitats such as the highland Cerrado savanna. *Source: GREENlines Issue #1881 6-9-03*



# Rare Cape Hunting Dogs Born at Denver Zoo

It may not have been 101 Dalmatians, but Denver Zoo keepers were excited and surprised when 14 Cape Hunting Dogs (*Lycaon pictus*) were born on 30 January 2003. Although keepers had been monitoring the expectant mother, Daisy, no one anticipated the record number of puppies in this delivery.

The litter was comprised of seven males and seven females and was the second litter of this critically endangered species to be born at the Denver Zoo. They were named as follows: the male puppies - Chaga, Madadi, Gombe, Vango, Datonga, Dogo and Tsavo; the females puppies - Kili, Asha, Malia, Eshe, Kamili, Taji and Boga. They are all named after cities, rivers or national parks in their native continent of Africa.

The puppies have been doing well under the protective care of their mother, their father Judd, and five sisters from the earlier litter. This species, also known as African wild dogs, live in packs and all members help raise the litter.

Cape hunting dogs are native to the open woodlands and plains of sub-Saharan Africa. Today the species are as rare in world zoos as they are in the wild. There are approximately 60 Cape hunting dogs in North American zoos and less than 5000 in the wild. The Denver Zoo is home to 21 Cape hunting dogs and has three more dogs on loan to another zoo. The wild population has been reduced as a result of disease and habitat destruction.

Each dog has its own unique markings of yellow, black, brown and white. The slim, long-legged dog features large round ears contributing to its acute sense of hearing. Another unique characteristic is it only has four toes on its front feet, rather than the typical five. It is carnivorous and has highly specialized sharp shearing teeth and is the most efficient of all predators. Adults stand 30 in. (76.2cm) at the shoulder and weigh between 40-60lbs. (18-27kg). Gestation period averages 70 days.

The Denver Zoo funds and is involved in several international conservation projects involving Cape hunting dogs both at the zoo and around the world. The Zoo currently funds a field study in Botswana investigating chemical communication through scent marking. Researchers are striving to understand how wild dogs communicate through scent marking. Understanding the role and content of scent marking is vital to conserving and managing wild dogs.



**Four of the 14 Cape hunting dog pups born in January at the Denver Zoo.** (Photo provided by the Denver Zoo PR Department)

*Source: Denver Zoo News Release written by Dave Parsons; Cape Hunting Dog Fact Sheet prepared by Angela Baier and Ana Bowie of the Denver Zoo PR Department.*





**Mother Daisy with several of her puppies.** *(Photo provided by the Denver Zoo PR Department)*

**Parents Daisy and Judd greet one of their 14 puppies.**

*(Photo provided by the Denver Zoo PR Department)*



**Two of the puppies battle over a bone in the exhibit yard.** *(Photo provided by the Denver Zoo PR Department)*



*Institutions wishing to advertise employment opportunities are asked to send pertinent data by the 10th of each month to: Opportunity Knocks/AKF, 3601 SW 29th St., Suite 133, Topeka, KS 66614-2054. Please include closing date for positions available, and when setting these dates keep in mind that because of bulk-mail, most readers do not receive their AKF until the middle of the month or later. There is no charge for this service and fax or e-mail listings of positions which become available close to deadline are accepted. Our Fax is (785) 273-1980; e-mail: [akfeditor@zk.kscoxmail.com](mailto:akfeditor@zk.kscoxmail.com) Listing may be sent as MS Word attachment. We are no longer located at the Topeka Zoo, so please note new address to avoid delays in processing.*

**Animal Keeper-Herpetology** - The Baltimore Zoo, Baltimore, MD

If you are interested in applying for this position, please fax or email your resume and cover letter attention Human Resources to (410) 396-7190 or [baltimorezooehr@hotmail.com](mailto:baltimorezooehr@hotmail.com). You may also mail this information to: The Baltimore Zoo, Attention: Human Resources, Druid Hill Park, Baltimore, MD 21217.

**Responsibilities:** The Animal Keeper is a salaried non-exempt position that is responsible for maintaining the reptile, amphibian, fish, and invertebrate collections as well as the exhibits and facilities, which house those collections. This position reports to the Herpetology Collection Manager. A more detailed job description is available by contacting Human Resources.

**Requirements:** The individual applying for this position must possess two years experience working with reptiles and/or amphibians, including venomous snakes, as well as excellent oral or written communication skills, including a strong working knowledge of the Microsoft Suite Software. The individual in this position must also be able to operate successfully in a multi-task environment, lift 50 pounds and possesses a valid driver's license.

**Curator of Reptiles and Amphibians** - The Baltimore Zoo, Baltimore, MD

This position reports to the Director of Animal Management, Research and Conservation. A more detailed job description may be obtained from Human Resources.

If you are interested in applying for this position, please fax or email your resume and cover letter attention Human Resources to (410) 396-7190 or [baltimorezooehr@hotmail.com](mailto:baltimorezooehr@hotmail.com). You may also mail this information to: The Baltimore Zoo, Attention: Human Resources, Druid Hill Park, Baltimore, MD 21217.

**Responsibilities:** The Curator of Reptiles and Amphibians is a salaried exempt position responsible for the senior management of the Herpetology department. The Curator position is responsible for assisting with recruiting and interviewing efforts for the department, training, scheduling, evaluating and supervising Herpetology staff. This position is also responsible for developing and directing the department's animal collection plan, husbandry programs for reptiles, amphibians, fish and invertebrates. This includes the conservation of such animals as well as conducting educational and research programs and securing the funding for such programs. The Curator of Reptiles and Amphibians is also responsible for managing departmental operating, capital and restricted budgets.

**Requirements:** The ideal candidate will possess a B.S. degree from an accredited college or university in Zoology, Biology, Wildlife Management, or animal related sciences, five (5) years of experience with a major herpetological collection (including venomous/dangerous species) in an AZA accredited institution, with three (3) years in a management capacity. This individual also must have proven experience developing and directing successful conservation/research programs, fundraising and designing exhibits and life support systems. The ability to lift 50 pounds, possession of a valid driver's license and AZA membership are also required.

**Curator of Live Collections** - Muskoka Wildlife Centre, Severn Bridge, Ontario, Canada

Please send resumé and references to the Muskoka Wildlife Centre via fax: (705) 689-0223 or email: [employment@muskokawildlifecentre.com](mailto:employment@muskokawildlifecentre.com) or mail: Box #89, Severn Bridge, Ontario, Canada. Hiring immediately, but will wait for the right person.

**Requirements:** Wildlife education centre featuring the province's largest collection of wildlife species native to Ontario is looking for a curator of live collections. Must have experience in animal husbandry, enclosure design, construction and maintenance as well as managing a small keeping staff. Knowledge of North American wildlife species ecology and captive management is a benefit. Year-round employment in Ontario's prime cottage country. Wage will be based on experience

**Chimp Keepers** – Goin' Ape/People and Chimps Together - Auburn, CA,  
Located 30 minutes Northeast of Sacramento, CA.

Please fax resumé and contact information to (530) 823-1874. Include three (3) work references with phone numbers. Please Do Not call. Please wait for us to respond to your fax.

We have an opening for two (2) part-time great ape/chimpanzee keepers. Looking for dedicated keepers to work with 16 chimpanzees and 1 orangutan ages 4-32. This group of chimpanzees have been together for 30 years. Wage is \$8-10/hr depending on experience. Health insurance after 90 day probation period and if moved to full-time. See our website at [www.chimpact.org](http://www.chimpact.org)

**Full-time Wardens – Two (2) positions** - Six-Flags Great Adventure Wild Animal Safari Park, Jackson, NJ. Seeking applications for two (2) full-time Safari Park Wardens. The Safari Park consists of 1200 animals including birds, reptiles and mammals.

Interested candidates should submit a resumé to: Karol Kempke, Human Resource Manager, P.O. Box 120, Jackson, NJ 08527. **Resumés being accepted until 31 July 2003.**

**Requirements:** Applicants must have strength, ability and alertness to work with various species of animals within a Safari Park. Applicants must have the ability to feed animals, clean houses, and general surroundings. Must be 18 years old, have valid driver's license, possess the ability to perform assigned duties in a safe & productive manner and be able to work in all types of weather conditions.

Six Flags Great Adventure offers an excellent salary and benefits package. Six Flags is an "Equal Opportunity Employer".

**Staff Veterinarian** - Six Flags Great Adventure Wild Safari Animal Safari Park, Jackson, NJ

Interested applicants should submit resume and three (3) letters of reference to: Karol Kempke – Manager, Human Resource, P.O. Box 120, Jackson, NJ 08527.

**Deadline for application is 25 July 2003.**

Seeking applications for a full-time veterinarian position. The Safari Park consists of 1200 animals including birds, reptiles and mammals with a main emphasis on hoofstock species.

**Responsibilities:** The applicant's responsibilities would include all aspects of zoological medicine and surgery as well as monitoring and modifying the preventative animal care program and medical record system, teaching college interns and communicating with the park staff and public.

**Requirements:** The applicant must have a VMD/DVM degree from an AVMA-accredited institution and must become licensed to practice veterinary medicine in NJ, within six (6) months of taking the position. Applicant must currently possess or is eligible to obtain DEA registration and USDA accreditation. (Salary based upon experience)

Six Flags Great Adventure is an "Equal Opportunity Employer".

**Zoo Keeper/Grasslands** - Audubon Zoo, New Orleans, LA

Send resumé to: Director of Human Resources, Mike Burnett, 6500 Magazine St., New Orleans, LA 70118 or email to: [mburnett@auduboninstitute.org](mailto:mburnett@auduboninstitute.org)

**Requirements:** Good written/oral communication skills and the ability to work effectively in a team-oriented environment. Associate's degree in biology or related field and one (1) year experience preferred or equivalent combination of training/experience in the care of mammals, preferably hoofstock, carnivores and primates. All candidates must have the ability to lift 80 lbs. and a willingness to work outdoors. A willingness to work weekends, holidays, and/or overtime is also required.

**General Working Supervisor - Mammal, Reptile & Bird Depts.** - Out of Africa Wildlifepark, AZ

Please mail or fax resumé to Dean Harrison, Out of Africa Wildlifepark, 9736 No. Ft. McDowell Rd, Scottsdale, AZ 85264. Phone (480) 837-6683, Fax (480) 837-7379. Visit our website at [www.outofafricapark.com](http://www.outofafricapark.com)

**Position open until filled.**

**Requirements:** Must have degree, four (4) years management, good people and communication skills. Experienced caregiving for many types of species, able to speak publically to large audiences, while interacting with animals in a full contact setting is necessary. Lifting up to 100 lbs may be required. Weekend and holiday work is necessary, according to shift. Salary depends on experience. Full benefits.

**Elephant Handler** - Natural Bridge Zoo, VA

Send resumé to: Natural Bridge Zoo, P.O. Box 88, Natural Bridge, VA 24578 or Fax (540) 291-1891 or phone (540) 291-2420 or email [NaturalBridgeZoo@hotmail.com](mailto:NaturalBridgeZoo@hotmail.com)

**Responsibilities:** The care and husbandry of two female African elephants (19 years old) in free contact. **Requirements:** Minimum of three (3) years experience working with elephants. Must be able to do rides, demonstrations and give talks to the public. Looking for an eager, energetic, friendly, self-motivating person. Housing available.



### **Aviculture Interns**

For more information on internships at **KBCC**, please send a resumé, cover letter, and the names and contacts of three (3) references to: Tracey Goltz P.O. Box 39 Volcano, HI 96785 or fax: 808-985-7034. **OR**, for more information on internships at **MBCC**, please send this information to: Mary Schwartz 2375 Olinda Road Makawao, HI 96768 or fax: 808-572-3574. For the Hawaii Endangered Bird Conservation Program at the Keauhou Bird Conservation Center (KBCC) on the Big Island of Hawaii and the Maui Bird Conservation Center (MBCC) on the island of Maui. **Responsibilities:** Daily tasks include husbandry duties such as: diet preparation, aviary and facility maintenance, behavioral observations of breeding birds, grounds keeping, predator control. **Requirements:** Applicant must be able to live with several roommates in a remote area and should show enthusiasm for work with captive endangered Hawaiian birds. Applicant must have a valid driver's license and health insurance. Internships last for a 3-6 month period. Interns receive \$20/day stipend plus housing. **Please, no phone calls or emails.**

### **Service Opportunities or Internships**

See additional information and application at our website - [www.tigercreek.org](http://www.tigercreek.org) < Commencement date: Open. Duration: Month by Month. Interested in learning more about big cats and a career path? Consider a service opportunity at TCWR. Two (2) positions currently available at Tiger Creek Wildlife Refuge, Tyler, TX. Interns are utilized for animal care positions through a qualification system. We provide: Room & Board, Materials and Curriculum, Indoctrination and Safety Training, Opportunity for full-time paid animal keeper positions (after training).

### **Marine Mammal Internship**

Interested candidates should submit a cover letter and resumé, transcripts, three (3) letters of recommendation, and an application from our website at [www.njaquarium.org](http://www.njaquarium.org). Please submit materials to New Jersey State Aquarium, c/o Nicole Begley, One Riverside Drive, Camden, NJ 08103. **Responsibilities:** Learn daily activities involving animal care and training with our Seal Team. Duties include food preparation, exhibit cleaning, creating enrichment devices and observing training. **Requirements:** Candidates should be comfortable with public speaking, have course work in biology/psychology, prior animal experience, be able to work outdoors, and lift 50lbs. Interns are required to complete a minimum of 120 hours and must be registered for college credits in either a two or four year school. Internships may be completed during spring, summer, or fall sessions. All intern positions are on a volunteer basis and are unpaid

### **Internship Opportunities - National Aquarium in Baltimore**

To apply for any of the following internship positions go online at [www.aqua.org/education/internships](http://www.aqua.org/education/internships) to obtain an application form. A complete application includes contact information, answers to brief statements listed, and a copy of college transcript. Complete applications should be sent to: National Aquarium at Baltimore-Internships, Pier 3/501 East Pratt St., Baltimore, MD 21202.

Application Deadline: ongoing - 1 November 2003 for January and Spring terms of 2004; 1 April 2004 for Summer and Fall 2004 terms; All interns must complete a minimum of 120 hours of work within the selected term. Interns must receive college credit for their internship. Internships are unpaid. For further information contact the National Aquarium in Baltimore's Internship coordinator at [intern@aquarium.org](mailto:intern@aquarium.org) or call (410) 576-3888.

#### **Aquarist Intern**

**Responsibilities:** The selected candidate will assist the Aquarium aquarist staff with daily care of the Aquarium's invertebrates and fish. Assist with tank maintenance and cleaning; Prepare daily diets and perform daily feedings; Assist in the maintenance of back-up areas; Conduct precise record keeping; Perform special projects to be determined by the aquarist staff. **Requirements:** College juniors or seniors enrolled in an accredited college, pursuing a degree in Biology, Ecology, Environmental Science, or a related field. Must be able to lift 50 lbs, climb up a 6' ladder, and be able to squeeze across a 15' long x 12" wide platform.

#### **Aviculture Intern**

**Responsibilities:** The selected candidate will assist the Aquarium aviculture staff with daily husbandry activities in the South American Rainforest exhibit. Assist with and perform diet preparation and distribution; Conduct animal observations; Assist in the cleaning of holding areas, kitchen, and food prep areas; Provide enrichment to the aviculture collection; Perform special projects as determined by the aviculture staff. **Requirements:** Interest in working with birds. Enrolled in an accredited college, pursuing a degree in Biology, Zoology, Animal Behavior, Ecology, Environmental Science, or a related field.

#### **Herpetology Intern**

**Responsibilities:** Tend the "Hidden Life" exhibits (large wall terrariums where small, neotropical lizards, frogs, snakes and invertebrates are on public display); Mist and clean the off-exhibit colony of small

arboreal lizards; Mist, clean and otherwise help tend the large, off-exhibit collection of neotropical frogs; Prepare diets for and feed the on and off-exhibit iguanas and tortoises; Tend the locust (live food) colony, orb-weaving spiders and colonies of non-venomous exotic arthropods (wood and hissing roaches, millipedes and walking sticks); Assist in the maintenance of the live food cultures (fruit flies, springtails, crickets, rats, mice); Conduct and record animal observations; Perform special projects as determined by the herpetology staff. **Requirements:** Must be enrolled in an accredited college, pursuing a degree in Biology, Zoology, Animal Behavior, Ecology, Environmental Science or a related field. Must be comfortable working with frogs, lizards, rodents and terrestrial arthropods.

#### Horticulture

**Responsibilities:** The selected candidate will assist the Aquarium horticulture staff with daily activities. Assist with care of plants in the Rain Forest exhibits; Conduct plant maintenance, fertilization, propagation, and transplantation; Assist in display development; Perform special projects as determined by the horticulture staff. **Requirements:** Must be enrolled in an accredited college, pursuing a degree in Biology, Ecology, Environmental Science, or a related field.

#### Marine Animal Rescue Program (MARP) Intern

**Responsibilities:** The selected candidate will aid in all aspects of marine animals rescue program (MARP) operations, which involves the rescue, rehabilitation, and release of stranded marine mammals and sea turtles and implementing outreach efforts of the Aquarium's Ocean Health Initiative. The selected candidate is also responsible for technical and clerical assistance for the Conservation Department staff as necessary. **Duties include:** Animal Care – participating in rescue and release trips, daily feeding, medical treatments, facility maintenance including cleaning and water changes, behavioral observations, and record keeping; Outreach – learning to interpret the MARP artifacts and conservation messages and participation in seasonal outreach and public education programs at the Aquarium and off site; Other duties as assigned – field work, etc. **Requirements:** Must be college junior or senior majoring in environmental science or related field with course work in biology and ecology. Summer and January terms require 40 hours per week of work for 4 weeks. Spring and fall terms require 8 hours per day, one day per week of work.

#### Marine Mammal Trainer Intern

**Responsibilities:** The selected candidate is responsible for providing support to the marine mammal training staff. This internship's primary purpose is to teach the intern training theory. **There is limited hands-on animal contact during the internship. Duties will include:** Prepares daily animal diets and dispenses vitamins as instructed; Responsible for the cleanliness and safety of all animal back-up areas; Assists in training, husbandry, and medical sessions; Participates in pre-show and pre-session preparations; Periodically participates in sessions involving swimming during enrichment and play sessions – no animals involved; Other duties as assigned. **Requirements:** Must be college junior or senior majoring in life science or related field. Must have a basic understanding of marine mammal natural history. Must have good swimming skills. Must work well as a team member. Summer and January terms require 40 hours per week of work for 4 weeks. Spring and fall terms require 8 hours per day, one day per week of work.

#### Water Quality Lab Intern

**Responsibilities:** The selected candidate will assist in the water quality testing of all fish and mammal systems throughout the aquarium. Duties include testing water for salinity, pH, ammonia, nitrite, alkalinity, and copper according to lab procedures, and recoding neat, accurate data. The selected candidate will work closely with the Lab Technicians and the Animal Husbandry staff. **Requirements:** Must be college junior or senior with general biology and chemistry work. Strong math skills and computer proficiency preferred. Must be available to work mornings.

*Positions posted with AAZK, Inc. may also be found on  
our website at [www.aazk.org](http://www.aazk.org)*

*Also, you may want to check out the AZA Member Institution job listings  
at <http://www.aza.org>*

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Mail this application to: AAZK Administrative Offices, 3601 S.W. 29th, Suite 133 Topeka, KS 66614-2054. Make checks/money orders payable to AAZK, Inc. Must be in U. S. FUNDS ONLY. Membership includes a subscription to *Animal Keepers' Forum*. The membership card is good for free admission to many zoos and aquariums in the U.S. and Canada.



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# ANIMAL KEEPERS' FORUM



The Journal of the American  
Association of Zoo Keepers, Inc.

**AUGUST 2003**

**ANIMAL KEEPERS' FORUM**, 3601 S.W. 29th St., Suite 133, Topeka, KS 66614-2054  
Phone: 1-800-242-4519 (U.S.) 1-800-468-1966 (Canada) FAX (785) 273-1980

**August 2003**  
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**Managing Editor:** Susan D. Chan • **Associate Editors:** Gretchen Ziegler, Sequoia Park Zoo & Kayla Grams, Lovell, WY • **Enrichment Options Coordinators:** Dawn Neptune, Utah's Hogle Zoo & Rachel Cantrell, Disney's Animal Kingdom • **Legislative Outlook Column Coordinator:** Georgann B. Johnston, Sacramento, CA. • **ABC's Column Coordinator:** Diana Guerrero, Big Bear Lake, CA • **Reactions Column Coordinator:** William K. Baker, Jr., Little Rock Zoo • **The Water Column Coordinators:** Dan Conklin and Kevin Shelton, The Florida Aquarium and Bruce Elkins, Indianapolis Zoo

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Biological Information (formerly Biological Values), 4th Edition - Jan Reed-Smith, Columbus Zoo  
AAZK Enrichment Notebook - Lee Houts, Folsom City Zoo



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## About the Cover.....

*This month's cover features a Cheetah (*Acinonyx jubatus*) drawn by Christine McKnight, a Keeper at the Minnesota Zoo in Apple Valley, MN. The cheetah is most well known for being the fastest land animal, capable of reaching speeds of 70 mph. The cheetah is aerodynamically built for speed and can accelerate from zero to 40 mph in three strides and to full speed of 70 mph in seconds. Prior to the 20th century, cheetahs were widely distributed throughout Africa and Asia. Today, the Asian cheetah is nearly extinct due to a decline of available habitat and prey. The last confirmed sighting in India was in 1948, but some may still exist in Iran, Pakistan, and Afghanistan. Loss of habitat, prey base, competition with large predators, agricultural interests and poaching are taking a heavy toll on wild cheetah populations throughout Africa. Today, there are less than 12,500 of these endangered cats remaining in Africa and Asia. Thanks, Christine!*

*Animal Keepers' Forum* publishes original papers and news items of interest to the animal keeping profession. Non-members are welcome to submit articles for consideration. Articles should be typed or hand-printed and double-spaced. Authors are encouraged to submit their manuscripts on a disk as well as in hard copy form. Manuscripts submitted either on disk or electronically as attachments to an email should be submitted in Microsoft WORD. All illustrations, graphs, charts and tables should be clearly marked, in final form and should fit in a page size **no greater than 5.5" x 8.5"** (14cm x 22cm). Literature used should be cited in the text (Brown, 1986) and alphabetically in the final bibliography. Avoid footnotes. Include scientific name (as per ISIS) the first time an animal name is used. Thereafter use common name. Use metric system for weights and measurements (standard equivalents may be noted in parenthesis). Use the continental dating system (day-month-year). Times should be listed as per the 24-hour clock (0800, 1630 hrs. etc.). Glossy black and white **or** color prints (minimum size 3" x 5" [8cm x 14cm] ) are accepted. Clearly marked captions should accompany photos. Please list photo credit on back of photo. Photographs may be submitted electronically as either JPEG or TIFF file attachments.

Articles sent to *Animal Keepers' Forum* will be reviewed by the editorial staff for publication. Articles of a research or technical nature will be submitted to one or more of the zoo professionals who serve as referees for *AKF*. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Lengthy articles may be separated into monthly installments at the discretion of the editor. The editor reserves the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed, appropriately-sized envelope. Telephone, fax or email contributions of late-breaking news or last-minute insertions are accepted as space allows. Phone 1-800-242-4519 (US); 1-800-468-1966 (Canada); FAX (785) 273-1980; email is [akfeditor@zk.kscoxmail.com](mailto:akfeditor@zk.kscoxmail.com)<

**Deadline for each regular issue is the 10th of the preceding month.**

**Dedicated issues may have separate deadline dates and will be noted by the editor.**

Articles printed do not necessarily reflect the opinions of the *AKF* staff or the American Association of Zoo Keepers, Inc. Publication does not indicate endorsement by the Association.

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E-Mail Addresses: You may reach Barbara Manspeaker at AAZK Administrative Offices at: [aazkoffice@zk.kscoxmail.com](mailto:aazkoffice@zk.kscoxmail.com)< You may reach Susan Chan and *Animal Keepers' Forum* at: [akfeditor@zk.kscoxmail.com](mailto:akfeditor@zk.kscoxmail.com)<

**AAZK Website Address: [www.aazk.org](http://www.aazk.org)**

**BFR Website: <http://bfr.aazk.org>**



# ***Scoops & Scuttlebutt***



## **Research/Conservation Workshop Planned for Cleveland Conference**

The AAZK Keepers in Research, and, Conservation, Restoration, and Preservation Grant Committees are sponsoring a Research and Conservation Workshop during the 2003 National Conference in Cleveland - Come and join us!

The workshop will cover a few of the many interesting and valuable projects members have initiated or participated in. We also will discuss some of the things you need to do to get involved in research or conservation; how to start your own project, and how the grant committees can better serve the AAZK membership.

AAZK offers three different \$1,000.00 grants each year. Come and join us and find out how you can benefit from this program. If you have been thinking of a research project bring the idea and we will help you, or just come and join the discussion on how AAZK can help you better know and research your animals. For questions or additional information contact: jan reed-smith at [jsmith@colszoo.org](mailto:jsmith@colszoo.org) or [jrsotter@iserv.net](mailto:jrsotter@iserv.net)

## **AZA Board of Regents Professional Development Awards**

To encourage participation in the AZA Professional Development Program, the Board of Regents makes four awards available to aquarium and zoo professionals to provide additional financial opportunities for individuals and institutions. We strongly encourage applications for the diversity advancement and international awards and we welcome your assistance in seeking qualified candidates. Each of the following awards provides funding for full tuition, lodging at the double-room rate, meals, air travel up to \$500, round-trip ground transportation from the airport to the school site, and an additional \$200 stipend to help defray costs normally incurred while attending the course. Award applications are available online at [www.aza.org/prodev](http://www.aza.org/prodev) or contact the AZA Training Administrator for application information. For consideration, complete award applications must be received by **1 October** for courses occurring the following year.

### **Diversity Advancement Award**

This award may be applied toward any of the AZA Professional Development courses. Its purpose is to support participation in the AZA Professional Development Program by under represented individuals who are AZA members and employed full time in an AZA zoo or aquarium.

### **International Conservation Training Award**

This award may be applied toward any of the AZA Professional Development courses. Its purpose is to promote professional training for our foreign zoological colleagues. Preference will be given to candidates who are currently involved in cooperative efforts with AZA member institutions or participating in TAGs, CAPs or SSPs. Employees of any zoo or aquarium outside the United States and Canada may apply.

### **Margaret A. Dankworth Management Award**

This award is given to a participant in Managing for Success: Career Development or Organizational Development. Successful applicants should demonstrate leadership ability or leadership potential at their present institution and a commitment to professional growth. Applicants must be AZA members employed full time in a zoo or aquarium.

### **Robert O. Wagner Professional Development Award**

This award may be applied toward any of the AZA Professional Development courses. Applicants should demonstrate professional involvement in AZA programs or conservation activities, leadership ability or leadership potential at their present institution, and a commitment to professional growth. Applicants must be AZA members employed full time in a zoo or aquarium.

## **Note of Correction on Upcoming Conference**

In the June and July issues of *AKF*, incorrect information was posted in Coming Events concerning the schedule for the 2003 ChimpanZoo Conference. The 2003 ChimpanZoo Conference will be held

25-29 October, 2003 in Boca Raton, FL. The focus of the meeting will be "Long Term Care for Captive Nonhuman Primates". Additional information is available on the ChimpanZoo website at [www.chimpanzoo.org](http://www.chimpanzoo.org) or by e-mail at [info@chimpanzoo.org](mailto:info@chimpanzoo.org) or by phone at (520) 621-4785. We apologize for any inconvenience this may have caused.

#### **6<sup>th</sup> International Zoo Design Symposium/Call for Papers**

Paignton Zoo Environmental Park will host the 6<sup>th</sup> International Zoo Design Symposium at the Grand Hotel, Torquay, Devon, UK from 9-13 May 2004. The theme of the conference will be "**Zoo Design: Innovation or Replication?**"



Most zoos now regard themselves as Conservation Centers, and the Fifth International Zoo Design Symposium hosted by Paignton Zoo in 1998 recognized that in its title and theme "Conservation Centers for the New Millennium". Since then zoos have been very successful at tapping into new sources of capital funding, many new exhibits have been built, visitor numbers have increased, and the amount of resource zoos put into the conservation of wild animals has increased exponentially. By any standards it has been an extraordinarily successful period in zoo history. But, all that obvious success apart, has the art of wild animal exhibition moved on? Are we being genuinely innovative or are we simply rehashing and reprising good ideas from the past? Would Carl Hagenbeck be yawning in his grave?!

In 2003 Paignton Zoo Environmental Park will open the 'Living Coasts' Marine Mammal and Bird Exhibit at Torquay Harbour within sight and easy walking distance of the conference venue. The conference program will include a visit and reception at this unusual and striking exhibit. South Devon is also within easy reach of the world famous Eden Project and an optional visit to the project will be included in the program. For conference booking forms please telephone +44 (0) 1803 697502 or e-mail: [zoodesign@paigntonzoo.org.uk](mailto:zoodesign@paigntonzoo.org.uk). Further information can be obtained from our Website: [www.paigntonzoo.org.uk](http://www.paigntonzoo.org.uk)

#### **Call for Papers**

Authors are invited to submit papers on all aspects of zoo design, particularly within the following areas:

- Spin or substance--does your design really do what it's supposed to do? How do you know?
- Plants - are they just a backdrop or an integral part of your conservation and education goals?
- IT - the good and bad
- Design conflicts - aesthetics, welfare, workability, conservation, education, research - can one exhibit do it all?
- Reconciling the irreconcilable - how to provide close contact while maximizing animal and visitor welfare.

Please send proposed title, authors, affiliations and an abstract (maximum 400 words) by email to [zoodesign@paigntonzoo.uk](mailto:zoodesign@paigntonzoo.uk). Please also complete the relevant section on the registration form on the website.

#### **SOS Rhino Seeks Volunteers**

SOS Rhino is looking for volunteers interested in helping us in our efforts to save the Sumatran rhinoceros. Our Borneo Team is studying the demographics of the remaining animals in Tabin Wildlife Reserve to determine when patrol units, habitat protection, or translocation may play a role in the rhinos' survival. Please visit SOS Rhino's web site for detailed information: <http://www.sosrhino.org/programs/volunteer.php> Or contact Cindy Salopek, Projects Associate/SOS Rhino via e-mail at: [cindy@sosrhino.org](mailto:cindy@sosrhino.org)



### Save the Rhino International Publishes E-Zine

The July edition of the "Save the Rhino International E-zine" has recently been published. If you are interested in rhinos then you must take a look, lots of interesting links, stories and updates. Contact info: Save the Rhino International (SRI)16 Winchester Walk London SE1 9AQ; <http://www.savetherhino.org>

Save the Rhino International promotes a practical conservation message which saves the rhino and other endangered species. The E-Zine aims to enhance access to information about rhino conservation around the world. Feel free to distribute it to anyone who might be interested. New readers can subscribe to future issues at <http://www.savetherhino.org><

### Editor's Recommendation - "A Conversation with Marvin Jones"

To anyone who has spent any time at all in the zoo business, the name "Marvin Jones" should need no introduction. The *Registrar Emeritus* of the San Diego Zoological Society began his life-long love affair with zoos beginning with his first visit at age six to The Philadelphia Zoo in 1934. His first work experience was at that same facility where he worked as a swing keeper, a job which only lasted a few months but which set him on course which would take him to zoos all over the world. After being drafted into the U.S. Army in 1951, he was sent with his unit to Germany. A high school drop-out, Marvin's passion for all things zoological led him to many years of independent study on the natural history of many animals, the history of the development of zoos, and the more "modern" zoo philosophies which began to emerge. He was fascinated with animal lineage and over his career amassed an incredible amount of information. I was amazed at his knowledge when I had the pleasure of having Marvin as my tour guide around the San Diego Zoo during an AAZK Conference. As he spoke about different animals we passed, he would tell us their life histories, including where the animal came from, who its parents were, whether or not it had bred, etc. etc.

The Preface for this book is written with obvious respect and admiration by Mark Rosenthal, Abra Prentice Wilkin Curator of Large Mammals at the Lincoln Park Zoo in Chicago, and Ken Kawata, General Curator at the Staten Island Zoo in New York. The Forward is penned by Clayton F. Freiheit, President and CEO of the Denver Zoological Society. But most of the book is an autobiographical journey written by Marvin himself. He writes with both knowledge and humor about his Army days, both in Europe and in Vietnam, during which time he visited many, many zoos and gathered data about some species which weren't even exhibited in the U.S. at the time. Marvin was in on the "ground floor" of many zoo innovations, including the formation of AAZPA (now AZA) and the beginning of ISIS. He became Registrar at the San Diego Zoo at a time when animal records were kept on 3x5 index cards. Reading about these early days of animal record keeping makes one truly appreciate how far we have come in this area.

As the book progresses, Marvin writes about aspects of the many zoos he visited both in Europe and the US, and particularly about those in Germany. Over his many years in the field, Marvin has met and become colleagues with many individuals we might call part of the "zoological dynasty". Perhaps the most interesting portion of this text is the Q & A section which covers about half the book. This section covers Q & A on Zoo Animals, Zoo People, Zoo Management, and Foreign Zoos. It reads like a candid conversation with one who "knows his stuff" and is willing to share his wealth of experience. As Rosenthal and Kawata note in their Preface of this book (a booklet really at 70 pages) "The final product may seem too meager to do him justice; to chronicle the man. However, we hope that we have provided a good start..." And indeed it is a "good start" and a glimpse into the fascinating life of a man who loves animals, zoos and cares passionately about their future. A worthy read.

If you are interested in getting a copy of *A Conversation with Marvin Jones*, you may order one for \$12 (includes s&h) from Bess Frank, Curator, Milwaukee County Zoo, 10001 Bluemound Rd., Milwaukee, WI 53226. Make checks payable to "Bess Frank". (Ed.)

# From the President.....

It has been a great two years serving as your President. I have seen firsthand the dedication and hard work that goes into making this Association a world leader in education of its members and in support of worthy conservation efforts. I am very honored that you have reelected me to continue to serve on the Board of Directors. I am equally honored to be serving with the other Board members that you have elected.

The past four years have been very busy. By the time we meet in Cleveland we will have some new reference tools for you to use in your job. In the past, books like the Crisis Management, Enrichment Notebook, Diet Notebook, Zoo Infant Development and Zoonotic Diseases have been invaluable in caring for our animals. As we near completion of our latest offerings (watch for an announcement soon in *AKF*), I would like to thank those who have worked to bring them to the membership. But as these colleagues take time to relax we must push forward to produce more tools that we can use to be the best animal care professionals that we can be. I look to the membership for ideas for what they need in their jobs. How can we help you do your job better? What can this association do for you? We will also need talented and energetic people to put these new tools together. Will you step up to serve your Association and colleagues?

We are also extending ourselves to working with other organizations to continue our tradition of excellence. We are working with ZCOG, Zoo Conservation Outreach Group, to translate the Enrichment Notebook into Spanish to assist our colleagues in Latin America. We have been contacted by a third AZA committee to provide our experience and expertise to their efforts. As the bonds between associations strengthen, we all benefit. Again I ask what else can we do to help you?

Thanks for listening and remember to take care of yourselves as you care for your animals.



Kevin R. Shelton, AAZK President  
The Florida Aquarium  
Tampa, FL



## **AAZK Website Has New Look - Check It Out!**

For those of you who haven't visited the AAZK, Inc. website recently you may want to stop by. It has a brand new look and new navigation which should make it easier to find your way around the site. There are also two new sections which have been added: the Animal Behavior Management Committee and Enrichment Committee both have informational sections on the new site. This is the first phase of the restructuring with more to come down the road. Any suggestions and/or comments are welcome. Again make sure you stop by to see the new and improved site at <http://www.aazk.org>.



# AAZK Announces New Members

## New Professional Members

Mark Hayes and Christina Carey, **The Philadelphia Zoo (PA)**; Corey S. Vann, **Catocin Zoo (MD)**; Emily G. Dill, **Duke University (NC)**; Tim Arnett, **Miami Metrozoo (FL)**; Justin Zolman, **Columbus Zoo (OH)**; Nicole Michelle Chiles, **The Toledo Zoo(OH)**; Karen Imboden, **Indianapolis Zoo (IN)**; Melanie Hiam, **Detroit Zoo (MI)**; Dawn Cummings, **Minnesota Zoo (MN)**; Makayla Poepperling, **Sedgwick County Zoo (KS)**; Carl J. Toborowsky, **St. Louis Zoo (MO)**; Randi Genung, **Folsom Children's Zoo (NE)**; Julie Hartell, **Houston Zoo (TX)**; George Nosis, **The Phoenix Zoo (AZ)**; Denali Meeks, **Out of Africa Wildlife Park (AZ)**; Mara Strauss, **The Oakland Zoo (CA)**; Kelly Corcoran, **San Francisco Zoo (CA)**; Dallas LaDucer, **Northwest Trek Wildlife Park (WA)**; and David Stephenson, **Honolulu Zoo (HI)**.

## Renewing Institutional Member

Busch Gardens  
Tampa, Florida

Arizona-Sonora Desert Museum  
Tucson, Arizona

## Renewing Contributing Members

Joan Diebold, Keeper  
Franklin Park Zoo  
Boston, Massachusetts

Vernon N. Kisling, Jr.  
High Springs, Florida

# Condor Update

## AZ Biologists Watch Condors

Although biologists have confirmed that California condors nesting in Arizona have produced three eggs, attention is focused on one pair that may have produced "the first condor to hatch and survive in Arizona in decades" reported the USFWS in early June. Nests with two of the eggs have been abandoned but the behavior of Condors 123 and 127 indicates that they could have a nestling that could be as old as three weeks.


Source: *GREENlines Issue # 1884 6-12-03*

## Ten-Fold Condor Increase




The California condor population, including those in captivity, has climbed to 222 birds, "a greater-than-tenfold increase from the historic low of 22 of the endangered vultures in 1982" reports the *San Diego Union-Tribune*. With 81 condors living in the wilds of Southern California and Arizona and 29 chicks expected to hatch this season, "this is the greatest the population has been probably since the 1950s" says the recovery program coordinator. Source: *GREENlines Issue # 1884 6-12-03*

## Lead Shot Endangers Condor Recovery

Lead poisoning from carcasses containing ammunition fragments is endangering efforts to rescue the California condor from extinction says *SFGate.com*, *AP*. Hunters "leave more than 30,000 lead-laced carcasses for the carrion scavengers each year" and two new studies show that condors "consume lead frequently as they feed on hunter-killed wildlife" and "can pass the lead poisoning on to offspring." In response, the USFWS is issuing new voluntary guidelines for hunters to help address the problem. Source: *GREENlines Issue #1889 6-19-03*



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# Coming Events

**Association of Avian Veterinarians 24th Annual Conference & Expo** - 25-29 August 2003 in Pittsburgh, PA. To view the entire program and to register on the web, visit [www.conferenceoffice.com/AAV](http://www.conferenceoffice.com/AAV). To contact the AAV Conference Office, email [AAV@conferenceoffice.com](mailto:AAV@conferenceoffice.com); phone (303) 756-8380; fax (303) 759-8861.

**American Zoo and Aquarium Association (AZA) Annual Conference** - 7 - 11 September 2003 in Columbus, OH. Hosted by Columbus Zoo and Aquarium. For more information contact Patty Peters: e-mail [ppeters@colszoo.org](mailto:ppeters@colszoo.org)

**2003 AZAD Annual Conference** - 9-14 September 2003. Hosted by Omaha's Henry Doorly Zoo, Omaha, NE. Interested parties may contact Judy Sorensen at 10969 North Lakeshore Dr., Blair, NE 68008 or by email at [howard@nfinity.com](mailto:howard@nfinity.com)

**2003 Association of Zoological Horticulture** - 13-18 September 2003. Hosted by Toledo Zoo. For more information contact Alan Donges at (419) 385-5721 ext. 2149 or email [greenhouse@toledozoo.org](mailto:greenhouse@toledozoo.org)

**2003 Red Panda SSP Keeper Training Workshop** 19-21 September 2003 at the Knoxville Zoological Gardens, Knoxville, TN. For more information contact Crystal Anderson at (865) 637-5331 ext. 389 or email [canderson@knoxville-zoo.org](mailto:canderson@knoxville-zoo.org)

**The Aquarium and Zoo Facilities Association** - 21-24 September 2003, hosted by the Philadelphia Zoo. For info visit [www.azfa.org](http://www.azfa.org) or contact Matt Suydam at (215) 243-5355 or fax (215) 243-5391.

**30th National AAZK Conference** - 26-30 September, 2003. Hosted by the Greater Cleveland AAZK Chapter and Cleveland Metroparks Zoo. Watch for further information in upcoming issues of *AKF*. Registration and Hotel Forms may be found in April issue and appeared again in the July *AKF*.

**Zoological Registrars Association (ZRA) 2003 Conference** - 2-4 October 2003, hosted by the Brookfield Zoo. For info visit [www.zra.homestead.com](http://www.zra.homestead.com) or contact Debbie Johnson (708) 485-0263 ext. 460; email [dejohnso@brookfieldzoo.org](mailto:dejohnso@brookfieldzoo.org) or contact Pam Krentz at [pak@clevelandmetroparks.com](mailto:pak@clevelandmetroparks.com)

**Elephant Managers Association Conference** - October 2-5, 2003 - Hosted by Knoxville Zoological Gardens, Knoxville, TN. For more information, call (865)-637-5331, ext. 359 or e-mail [bhargis@knoxville-zoo.org](mailto:bhargis@knoxville-zoo.org)

**First International Conference on Zookeeping in 2003** - The Netherlands - Will be held between 2-10 October at Birdpark Avifauna. For further information please visit: [www.iczoo.org](http://www.iczoo.org)

**American Association of Zoo Veterinarians** - 5-9 October, 2003 in Minneapolis, MN. For additional information, visit the AAZV website at [www.aazv.org](http://www.aazv.org) or contact Wilbur Amand, VMD, Executive Director/AAZV, 6 North Pennell Rd., Media, PA 19063; Phone (610) 892-4812; Fax (610) 892-4813; email [AAZV@aol.com](mailto:AAZV@aol.com)

**The 2003 ChimpanZoo Conference** - 25-29 October, 2003 in Boca Raton, FL. The focus of the meeting will be "Long Term Care for Captive Nonhuman Primates". Additional information is available on the ChimpanZoo website at [www.chimpanzoo.org](http://www.chimpanzoo.org) or by e-mail at [info@chimpanzoo.org](mailto:info@chimpanzoo.org) or by phone at (520) 621-4785.

**The Sixth International Conference on Environmental Enrichment** - 2-7 November 2003 in Johannesburg Zoo, South Africa. Sixth International Conference on Environmental Enrichment in Johannesburg Zoo, South Africa. Hosted by the Johannesburg Zoo. For more information on the conference, including fees, registration facilities, reduced flights and pre- and post-conference tours, please go to [www.jhbzoo.org.za](http://www.jhbzoo.org.za) or contact Mathew van Lierop at [mathew@jhbzoo.org.za](mailto:mathew@jhbzoo.org.za) or on +83 600 2677.

**ACVP/ASVCP 2003 Concurrent Annual Meeting** - American College of Veterinary Pathologists and American Society of Veterinary Clinical Pathology joint meeting - 15-19 November, 2003 in Banff, Alberta, Canada. For more info contact ACVP at: Phone - (608) 833-8725 ext. 145; Fax - (608) 831-5485; email - [meetings@acvp.org](mailto:meetings@acvp.org); web - [www.acvp.org/meeting/](http://www.acvp.org/meeting/)

**International Polar Bear Husbandry Conference** 4-7 February 2004 in San Diego, CA. Polar Bear International (PBI) in association with the AZA's Bear TAG are cohosting this conference to be held at the Bahia Hotel on Mission Bay. They are bringing together many of the most experienced and knowledgeable "bear" professionals in the world, including noted scientists, zookeepers, and naturalists representing a broad spectrum of institutions. Information and online registration is now available on PBI's website (<http://www.polarbearsinternational.org>). This includes the invited speaker list (updated monthly) as well as the conference agenda, goals, scholarship information and other specifics. Any questions,

**Post Your Coming Event Here - email to**  
[akfeditor@zk.kscoxmail.com](mailto:akfeditor@zk.kscoxmail.com)



# Tentative Schedule for the 2003 National AAZK Conference

*"Strange Situations .....Wild Occupations"*

## **Thursday, September 25**

Closed meeting of the AAZK Board of Directors  
Pre-conference trip departs

## **Friday, September 26**

AAZK committee meetings (open)  
Pre-conference trip returns  
7-11 PM Icebreaker at Jacob's Field Terrace Club

## **Saturday, September 27**

Keynote Address – Dr. J. Michael Fay, National Geographic Society  
Paper Sessions Day 1  
Evening workshops or planned night out

## **Sunday, September 28**

Day 2 Address – Laurie Marker, Cheetah Conservation Fund  
Paper Sessions  
Evening workshops or planned night out

## **Monday, September 29**

ZOO DAY  
Silent Auction in evening at hotel

## **Tuesday, September 30**

Paper Sessions  
Awards Luncheon, Business Meeting, and Conference Bids  
Closing Banquet and Live Auction

## **October 1 - 2**

Post-conference trip

## **PRE-CONFERENCE TRIP** - September 25 – 26, 2003

The group will be leaving the Sheraton City Centre at 7:00 AM on September 25, 2003 traveling to the Detroit Zoo. We will be staying in Toledo, compliments of the Toledo Zoo. The group will return to the Sheraton City Centre approximately 5:00 PM on September 26, 2003. **Cost: Free but delegates will need to purchase one meal. Trip limited to 30 people.**

## **POST-CONFERENCE TRIP** - October 1 – 2, 2003

The group will be leaving the Sheraton City Centre 6:30 AM on October 1, 2003 traveling to the Ohiopyle State Park for a day of whitewater rafting and enjoying the scenic highlands. We will then travel to the Pittsburgh Zoo and National Aviary. Delegates will be staying at the Super 8 Motel in the Allegheny Valley at Exit 5 of the PA Turnpike. We will be returning approximately 8:00 PM on October 2, 2003. **Cost: \$75 per person. Trip limited to 30 people.**

Any questions you can e-mail Maureen Meslovich  
at [momeslo@cs.com](mailto:momeslo@cs.com) or call (216) 661-6500

**(Editor's Note: A Registration Form for the Pre- and Post-Conference Trips is available in the lilac insert in the July issue of AKF.)**



# Tentative Schedule of Papers, Posters, and Workshops for the 2003 AAZK National Conference

## Paper Presentations

To Russia with Love: A Synopsis of the Tenth Year of the Russian Crane Project with a Look to the Future  
*Christopher Munch, Lead Aviculturist, The National Aviary*

Guam Rail Reintroduction Project  
*Chris Edelen, Aviculturist, Cincinnati Zoo and Botanical Garden*

Protocol Importance in the Husbandry of Gabriella's Crested Gibbons.  
*Denise C. Wagner, Senior Keeper, San Diego Wild Animal Park*

AAZK Cooperative Partnerships: Working with Local and Regional Organizations on Conservation Projects  
*Carolyn Matthews-Borak, Zookeeper*  
*Kelly Russo, Communications Specialist, Houston, Zoo*

Raising Asia...Successfully Raising a Sloth Bear Cub  
*Trudy Kuhr, Large Mammal/Carnivore Keeper; Dianna Lydick, Toledo Zoo*

Experiences with Caribbean flamingo *Phoenicopterus ruber ruber* Chick Hand-rearing at the Birmingham Zoo  
*Jeff Pribble, Bird Keeper; Cindy Pinger, Zoological Manager of Birds;*  
*Tim Snyder, Curator of Birds, Birmingham Zoo*

Cost-free Fundraising Through Printer Cartridge Recycling - Building Your Donor Network  
*Juliette Grace, Executive Director, GreenFund Network; Kevin Shelton, President, AAZK Inc.*

Phoenix Rising: Tidbinbilla Nature Reserve.  
*Geoff Underwood, Senior Wildlife Officer, Tidbinbilla Nature Reserve, Australia*

Recall and Crate Training in a Free-flight Aviary.  
*Heather Leeson, Biologist II, Moody Gardens*

Tracking Orangutan Ovulation Cycles Through Cytology  
*Nannette Driver, Primate Keeper, Chaffee Zoological Gardens*

The Living Desert's Cheetah Ambassador Program.  
*Jennifer Johnson, Animal Care Supervisor; Leslie Storer, Lead Trainer;*  
*Nicole Hernandez, Trainer/Presenter, The Living Desert Zoo and Gardens*

ABCs from A to Z: Animals, Business, and Conservation in Aquariums and Zoos  
*Bruce L. Carr, Ph.D., AZA*

Managing the Socialization of a Speke's Gazelle at the Saint Louis Zoo.  
*Christy Poelker, Keeper/Ungulates, Saint Louis Zoo*

Perceptions and Data: The Effect of Estrus Cycles on a Non-reproductive Chimpanzee Group  
*Christine Sumner, Keeper Lincoln Park Zoo*

The Evolution of the Night Keeper at Disney's Animal Kingdom.  
*Martin Ramirez, Night Zoological Manager, Disney's Animal Kingdom*

The Lake Malawi Aquarium and Quarantine System at Lincoln Park Zoo's Regenstein African Journey  
*Anthony M. Nielsen, Animal Keeper, Lincoln Park Zoo*

Auditory and Olfactory Enrichment Trials in the Cougar *Felis concolor*.  
*Amanda Ramsey, Mammal Keeper, Nashville Zoo*

Project Golden Frog/Proyecto Rana Dorada  
*Anthony Wisnieski, Director of Captive Program, Project Golden Frog Conservation Fund*



A Dog-gone Wild Time at the Minnesota Zoo  
*Christine McKnight, Zoo Keeper, Minnesota Zoo*

Behavior Management + AAZK + Zoo Members = Fun & \$ for Conservation at the Minnesota Zoo  
*Christine McKnight, Zoo Keeper, Minnesota Zoo*

“Are you looking for that furry black thing?”  
A Mixed Species Exhibit Featuring Malayan Tapirs and Binturongs Makes for Some Strange  
Situations and a Wild Occupation for Zoo Keepers at the Minnesota Zoo  
*Christine McKnight, Zoo Keeper, Minnesota Zoo*

Developments in Breeding and Managing Cockatoos  
*Katy McElroy, Owner, Hornbeam Aviary, Toledo, OH*

Disney’s Animal Kingdom Veterinary Services Wildlife Program  
*Kim Kearns, Hospital Keeper, Disney’s Animal Kingdom*

Transformation from Menageries to New Millennium Conservation Centre  
*Jonathon O.F. Fayomi, Head Zoo Keeper/Educator Zoological Garden, University of Ibadan, Nigeria*

The Survivorship of Captive-bred, Released Louisiana Pine Snakes  
*Amy C. Davis, Reptile Keeper, Audubon Zoo*

Tapping Teenage Talent  
*Lee Houts, Zoo Keeper, Folsom City Zoo Sanctuary*

The Addition of a New Lemur Species into an Existing Multi-species Lemur Exhibit at the Hattiesburg Zoo  
*Staff, Hattiesburg Zoo, Hattiesburg MS*

Developing a Multi-functional Callitrichid Nest Box to Combine with Operant Conditioning to Increase  
Animal Husbandry and Decrease the Potential for Stress when Chemical Restraint is Necessary  
*Michelle Farmerie, Primate Keeper/Trainer, Pittsburgh Zoo and PPG Aquarium*

Environmental Enrichment: Achieving Zoo-wide Animal Enrichment Days  
Through Successive Approximation and Positive Reinforcement  
*Michelle Farmerie, Primate Keeper/Trainer, Pittsburgh Zoo and PPG Aquarium*

The Role of Woodland Park Zookeepers in a Ferruginous Hawk Satellite Telemetry Project  
*Tom Aversa, Raptor Keeper, Woodland Park Zoo*

A Zookeeper’s Role in Exhibit Design  
*Jay Tetzloff, Senior Keeper/Mammals, Sedgwick County Zoo*

Striving for Successful Births in a Young Pair of Golden Lion Tamarins (*Leontopithecus rosalia*)  
*Tamara Singer, Sara Pilon, and Rebecca Notcher, Mammal Keepers, Rosamund Gifford Zoo at Burnet Park*

For Conservation’s Sake: The Clouded Leopard Project  
*Stephanie Prine, Zoo Keeper, Pt. Defiance Zoo and Aquarium*

Translocation of Blue and Gold Macaw (*Ara ararauna*) into its Historical Range on Trinidad  
*Steve Malowski, Aviculture Department, Cincinnati Zoo and Botanical Garden*

*Homo sapiens* – The Hardest Animals to Train  
“Running a Successful Internship Program at Your Facility”  
*Jessica Hoffman, Children’s Center Supervisor, Fossil Rim Wildlife Center*

Chiropractic Care in Animals - “An Alternative Approach to Geriatric Care”  
*Jessica Hoffman, Children’s Center Supervisor, Fossil Rim Wildlife Center*

Wildlife Management in Metropolitan Cleveland: Taking Conservation Beyond the Zoo  
*Dr. Daniel R. Petit, Manager of Natural Resources Research, Cleveland Metroparks*

The Best Zoos in the 21<sup>st</sup> Century  
*Steve H. Taylor, Director, Cleveland Metroparks Zoo*

Surplus Animals: Stewardship on the Ark  
*Albert H. Lewandowski, DVM, Cleveland Metroparks Zoo*

So Many Cats, So Little Time – The Enrichment Challenge  
*Laura Carpenter, Zoo Keeper, Cincinnati Zoo*

Changing Exotic Animal Ownership Regulations.  
*Jennifer Mattive, Co-owner, T & D's Cats of the World – Exotic and Wild Animal Refuge*

When Plan A Becomes Plan Z: The Challenges of Shifting a Resistant Pair of Black Rhinoceros  
(*Diceros bicornis*) to a New Exhibit Through Positive Reinforcement and PATIENCE.  
*Tammy Schmidt, Zoo Keeper, St. Louis Zoological Park*

Welcome to the Information Age: How to Find, Evaluate, and Use the Information You Need  
*Dorothy Barr, Library Assistant, Simmons College; Linda Rohr, Registrar/Librarian, Zoo New England*

Making a Difference with Bowling for Rhinos.  
*Patty Pearthree, National BFR Chair*

### Posters

**A Multivariate GIS Model to Determine Black Bear (*Ursus americanus*) Habitat Suitability in Eastern Ohio**, Shane Good, Animal Keeper, Cleveland Metroparks Zoo; **Alternatives to Parent-rearing in *Pteropus* Species at the Lubee Foundation**, Ingrith Martinez, Senior Keeper, The Lubee Foundation, Inc.; **Conditioning Male Rockhopper Penguins (*Eudyptes chryocome*) to Accept Voluntary Semen Collection**, Tammy Root, Senior Aquarist of Birds and Herps, Indianapolis Zoo; **Penguins and Fish Can Co-exist**, Diane Olsen, Lead Biologist, Moody Gardens; **Improvised Rearing of Red-bellied Piranha (*Pygocentrus nattereri*) in an Endotherm-dominated Institution**, Jason T. Moore & Pam Swift-Brooks, Zoo Keepers, Topeka Zoological Gardens; **Project Golden Frog**, Katherine L. Duffey, Animal Keeper, Cleveland Metroparks Zoo; **Building a Breeding Herd**, Shelly Wagner, Zoo Keeper, St. Louis Zoological Park; **Enrichment: From Animals to Audience**, Michelle Farmerie, Primate Keeper/Trainer, Pittsburgh Zoo and PPG Aquarium; **Who Says You Can't Teach an Old Ram New Tricks?**, Bethany J. Lutz, Hoofstock Keeper, Utah's Hogle Zoo; **Survival of the Fishing Cats: Successes and Failures in Fishing Cat Reproduction at the San Francisco Zoo**, Barbara Palmer, Animal Keeper, San Francisco Zoo; **Developing Improved and Safer Control Measures for Helminth Parasites of Bears in Zoological Parks**, Jordan C. Schaul, MS, PhD Candidate, Ohio State University; **The Enrichment Tree**, Amy O'Neill, Education Specialist & Karen Vacco, Lead Keeper, Pittsburgh Zoo & PPG Aquarium.

### Workshops

**AAZK, Zoo Animal Staff, and Research - Why it's a good idea and how to get involved**  
*Jan Reed-Smith, Columbus Zoo*

**Advances in Animal Keeping in Zoos and Aquariums –  
A new AAZK-AZA Professional Keeper Training Program**  
*Bruce Carr, Ph.D., AZA*

**Amphibian Workshop**  
*Katherine L. Duffey, Animal Keeper, Cleveland Metroparks Zoo*

**Animal Welfare, Enrichment, and the AZA: What do they mean to keepers?**  
*Amy Burgess, AAZK National Enrichment Co-Chair*

**Australasian RAP Session**  
*Jacque Blessington, AAZK Board of Directors, Kansas City Zoological Gardens*

**Primate Workshop**  
*Tad Schoffner, Assistant Animal Care Manager, Cleveland Metroparks Zoo*



# ABC'S

## ABC's: Animal Behavior Concerns and Solutions

*A Question & Answer Forum for Animal Professionals*

©2003 by Diana Guerrero, Independent Behavior Consultant  
Ark Animals of California, Big Bear Lake, CA



### Question

In your last column you talked about an animal held in a privately-owned facility. The animal appeared to be held in a private home. Can you comment on why you included it in the column?

### Answer

The last column created quite a stir. The animal profession is always changing and improving and cannot do so without passionate dialog. It is great to hear from the readership, however it must be reiterated that the columns and articles found within *AKF* do not reflect the opinions (or endorsement) of the *Animal Keepers' Forum* (*AKF*) staff or the American Association of Zoo Keepers, Inc. (*AAZK*).

Since 1996, this column has discussed animal behavior concerns and solutions from a variety of sources. This is not the first time an inquiry of this type has been included. As a columnist for *AKF*, I answer questions related to municipal zoos, private facilities, rescue organizations, educational facilities, circuses, museums, breeders, and other individuals who maintain collections of wild animals.

The inquiries for *ABC'S* arrive from all over the world and are submitted by those who are concerned for the welfare of their animals, or of the animals they manage or protect. The variety of submissions reflects the diversity in readership. The questions presented originate from individuals with a multitude of experience levels, concerns, and backgrounds. Many of the inquiries come in, not just from recognized zoos, but also from agencies not affiliated with zoos. *AKF* provides a valuable resource to these agencies and individuals — and has done so for years.

My goal and dedication as an animal behaviorist is to help any animal through education, environmental enrichment, and training or behavioral advice. I do not screen out inquiries from the *AAZK* column, nor do I refuse to answer them based on who is submitting. All behavioral situations reveal valuable information that others involved in animal caretaking or training can benefit from and that is why they are included.

Today, the issue of captive animals is a volatile one from every angle. There are groups against zoos, against interfering with the natural environment, against pets of any kind, against laboratory animals, etc. Just name the project, or concern, and there probably is a group of people avidly against it! In the case of captive wild animals, the general professional opinion is that they do not make good pets.

Even so, there are many who do have them as pets, and many who breed and sell them for the pet trade, including professional zoo keepers and animal trainers. Personally, I do not condone the private ownership of ANY wild animal by inexperienced individuals (like the general public), however

the reality is that they do exist. Having said that, an animal owner labeled as a “professional” does not necessarily mean the animal benefits any more than another creature housed elsewhere. Although there are generally more complications and concerns that stem from individual private ownership, I’ve worked in a variety of capacities and witnessed the gamut of problems with animals in virtually every type of setting. There are good conditions in both the private and professional realm, and dismal situations on each side of the fence as well.

Although it is not as common for the American general public to own wild animals, they do exist everywhere, and it was not too long ago that wild animals such as birds and reptiles were considered as unusual pets instead of “acceptable.” Today, in addition to illegal trade, there are many people and institutions that breed animals, and that participate in animal auctions — buying wild animals for resale or trade. The industry will continue as long as there is money to be made and animals to sell. The regulations concerning wild animals have been getting tighter and the restrictions have escalated. This tightening is directly due to much of the abuse that occurs when wild animals or hybrids are taken as pets by the layperson, but that is only a fraction of the problem.

Having said that, let me point out that wild animals do not make good pets because they are creatures that have evolved within a specific niche in nature and have special physiological and psychological adaptations to insure that survival. Most people cannot provide the intensive care these creatures need, nor are they prepared for the long-term and comprehensive maintenance they require.

Additional reasons are that wild critters have specialized nutritional, social, and activity needs, are adapted to a particular type of environment, and are extremely agile and powerful. Wildlife will still maintain territorial structures or hierarchies, and engage in sexual or aggressive behavior that can be risky to those unfamiliar with those behaviors and patterns.

Capricious breeding, irresponsible behavior, and impact on the habitat of local wildlife are further concerns. Others include the complicated interference on local wildlife populations if non-native animals are released or escape by accident. The risk of zoonotic diseases or parasites is yet another worry for both humans and other animals.

The quality of captive wildlife management and ownership will continue to be a concern to those involved with animals and their conservation. If we are going to move forward to benefit our charges, and those housed elsewhere, it is going to be necessary to move constructively from the prevalent and disturbing “us” and “them” attitude. Yes, there are problems. Most professionals are concerned about them and working to alleviate them. As part of the solution, I am happy to help those who need it. Finally, I also recommend the animal daily minimum requirements for those housing any type of animal:

#### ***ANIMAL DAILY MINIMUM REQUIREMENTS***

- mental activity
- physical activity
- companionship
- adequate and regular veterinary care
- appropriate nourishment or nutrition
- daily assessment and quality management
- a suitable, safe, secure, clean and comfortable environment

(About the Columnist: Since 1978 Diana Guerrero has worked professionally with both wild and domestic animals. She has been affiliated with and certified by a variety of animal programs in the USA and Europe. She currently writes, consults and leads safaris. Information and enrollment for her safaris, seminars, training courses and animal career programs can be found at her website: <http://www.arkanimals.com>. Publications and other training support items may also be purchased at the site. Questions for ABC’s should be submitted to Diana directly via email: [arkabc@arkanimals.com](mailto:arkabc@arkanimals.com), through the ABC’S questionnaire on her website, or via regular mail: c/o ARKANIMALS.COM, P.O. Box 1989-215, Big Bear Lake, CA 92315 USA.)



## North Carolina AAZK Chapter

The North Carolina AAZK Chapter has been very busy the past seven months. In December we hosted the Holiday party which raised over \$400 for our Chapter!

In January elections were held. Our new officers are:

President.....Brad Lympany

Vice President.....Paul Decker

Secretary/Chapter Liaison-----Shelley Harvey

Treasurer.....Lucy Segerson



*Committed to Conservation*

In March we volunteered at UNCTV, the local public television station answering phone calls and taking pledges. We also helped with trail clean-up and fence repair at Hidden Horse Farm, the local therapeutic riding center.

April brought us into the 21st century when we got our website up and running ([www.nczoo.org/aazk](http://www.nczoo.org/aazk)). Easter weekend we hosted our first annual Rhino Conservation Station. We set up a booth next to the White Rhino exhibit where visitors could read about the plight of rhinos, compare and contrast the different species, look at bifocals that were available, and listen to a CD with rhino vocalizations! This was a huge success and we hope to keep it going every year. The best part is that we earned an additional \$50 for BFR from the donation box.

In May Bowling for Rhinos was a big event. As always it was a great success. Finally, for June we held our annual Zoo Picnic where AAZK sponsors a raffle. Grand prize was a ride along through the African Plains exhibit.

# Chapter News Notes

We plan on taking a small break in July to collect our thoughts and then jump back into things.

*---Shelley Harvey, Chapter Liaison*

## Indianapolis AAZK Chapter

For 2003, the Indianapolis AAZK Chapter's Bowling for Rhinos event was a very successful one! Not only did we raise over \$5000.00, but this was the first year that we had a radio station as a sponsor. We would like to thank 92.3 WITS for participating in this event. They gave us a sponsorship commitment of 40 live promotional announcements, 26 "Things to Do, Places to Go" announcements, inclusion on their website and a two-hour remote during the Bowling for Rhinos event.

Other sponsors included CAC Print Wear and All Star Bowl. We had 105 bowlers, lots of pizza, and lots of fun!



**What's you AAZK Chapter been up to?  
Send your Chapter News to the Editor at:  
[akfeditor@zk.kscoxmail.com](mailto:akfeditor@zk.kscoxmail.com)**

# Exotic Diseases - Part 3

## Exotic Newcastle Disease

*Editor's Note: The following is part three of a Three Part series on Exotic Diseases being reprinted here with permission from the author. It originally appeared in The Keeper, Spring 2003, the newsletter of the San Diego Chapter of AAZK. If you missed Parts 1 & 2, look for them in the June and July 2003 issues of AKF)*

*By Yvette M. Kemp, Sr. Mammal Keeper  
San Diego Zoo, San Diego, CA*

It seems that in the last few years we have heard about more exotic diseases than we have in a long time. First it was the pyres of burning cattle carcasses from foot and mouth disease (FMD) in Europe, then it was West Nile disease on the east coast, now it's Newcastle disease in San Diego. It doesn't get any closer to home than that.

Since it is so close to home, there are precautions that we need to take to prevent the spread of Newcastle disease, and other diseases, into our work and, for many, into our homes. Learning about the diseases is a way of learning how to recognize their symptoms and how to prevent spreading them. The U.S. Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS) are responsible for protecting U.S. livestock and are the sources for most of the following information. Hopefully, by sharing this information with you it will assist us in the care and disease prevention of the animals we are responsible for. If you would like more information, just log onto [www.aphis.usda.gov](http://www.aphis.usda.gov), [www.cdffa.ca.gov](http://www.cdffa.ca.gov), and/ or [www.nwhc.usgs.gov](http://www.nwhc.usgs.gov). It is amazing to see the amount of information we have at our fingertips.

### EXOTIC NEWCASTLE DISEASE (END)

Newcastle disease is a highly contagious and fatal disease of birds caused by a paramyxovirus. It often causes high mortality in chickens, but all birds are susceptible.

Cockatiels, budgies, amazons and cockatoos are highly susceptible to Exotic Newcastle disease. Lorys, macaws, canaries, finches, Mynahs and African greys may not show signs but act as carriers. Some of the other birds affected by this disease are fowls, turkeys, geese, ducks, pheasants, guinea fowl and other wild and captive birds such as ostriches, emus and rhea. It is one

of the most infectious diseases of the poultry world and is so virulent that many birds die without showing any clinical signs. And some infected birds that do not show signs of being infected can spread the disease to other birds with fatal consequences.

One of the classical signs of END is tremors and involuntary shaking of the head and body when birds try to move. Other signs may include anorexia, diarrhea, paralysis, twisted neck, difficulty breathing, etc., but these are all signs that may be seen in other bird diseases. To confirm a diagnosis, laboratory tests must be done. Diagnosis can be made in live birds by virus isolation from feces, cloacal and tracheal swabs. Lung, intestine, brain, liver and spleen are suitable organs for virus isolation. And serology can be used for screening. Unfortunately though, there is no treatment for the disease and affected birds must be destroyed. END was first diagnosed in CA in 1950 among pheasants imported from Hong Kong.

In 1971 a major outbreak occurred in Southern California in commercial poultry flocks where almost 12 million birds were destroyed and cost taxpayers \$56 million in an eradication program. It disrupted the operations of many producers and increased the prices of poultry and poultry products to consumers.

More recently, October 1, 2002 to be exact, END was diagnosed in backyard poultry flocks in L.A. County. The CA Department of Food and Agriculture (CDFA) and the USDA are currently conducting an eradication program for END. Officials are going door to door to find sick birds in affected areas and are tracing birds into and out of infected flocks. In late December of 2002, a commercial poultry farm by San Diego, in Ramona, was also diagnosed with END.

As of December, 1.2 million chickens have been slaughtered and Canada and Mexico have banned shipments of poultry and poultry products from California.

Areas that have been quarantined include San Diego, Orange, Los Angeles, Riverside and San Bernardino counties. Recently Santa Barbara, Ventura and Imperial counties were added to create a "buffer zone," in hopes of providing additional security. By early January 2003, San Diego County was placed in quarantine as well. On January 16, 2003, END was also confirmed in a backyard flock in Las Vegas, Nevada. Federal and state quarantines have been



established for all of Clark County and a portion of Nye County, NV. APHIS and the State of Nevada have begun surveillance efforts of the backyard bird population and to establish a task force in Nevada.

Quarantines will be in effect until Exotic Newcastle Disease has been eradicated from CA, and most likely anywhere else it is found. Some of the measures that are being taken include:

- Over 695 people working to eradicate this disease.
- 6,028 premises quarantined while investigations continue.
- 1,220 of these premises contained birds infected or exposed to END and have or will be humanely destroyed. Once the birds are removed, premises are cleaned and disinfected.

Because END is such a highly contagious disease, measures have been taken at the San Diego Zoo and Wild Animal Park, as well as the L.A. Zoo, to ensure the safety and welfare of the bird collections. All the San Diego Zoological Societies walk-through aviaries have been closed and animal presentations with direct contact possibilities between guests and birds have been suspended. The Veterinary Services and Bird Department also held an informative question and answer session for all zoo staff affected by the outbreak of the disease. Several guidelines as to the care of our bird facilities and their surroundings were also implemented and can be obtained from either department.

Although Exotic Newcastle Disease is not a public health threat and does not affect the safety of poultry or eggs, it can have a devastating affect on our economy, and more closely, our wonderful bird collection.

To learn more about these or any other animal diseases, refer to the Internet. It really is a sea of information!

Editor's Note: the following guidelines are presented here with the permission of the San Diego Zoological Society. However, please note the following:

\* Our guidelines are NOT to serve as guideline for other institutions but are an example of how the SDZ handled their situation, and

\* A good working relationship and dialog with the local regulatory officials should be made when developing protocols for your institution.

## **SAN DIEGO ZOO EXOTIC NEWCASTLES DISEASE BIOSECURITY GUIDELINES**

**GOAL:** To Minimize the opportunity for Exotic Newcastle Disease (END) to enter the collection.

1. Overview
2. Responsible Employees
3. Uniforms
4. Footbaths and vehicle disinfection
5. Vehicle Disinfection
6. Delivery of Dead Birds to Necropsy
7. Bird Escapes
8. Behind the Scenes Tours
9. Visitors, observers, Visit-A-Job Program
10. Guidelines for supervisors when an employee reports illness or death in birds housed at home.
11. Bird Enrichment  
Use of blowers around bird exhibits

### **1. OVERVIEW**

San Diego Zoo Biosecurity Measures to Reduce to Risk of Exotic Newcastle Disease Entering the Bird Collection

#### **History**

Exotic Newcastle Disease (END) is a highly pathogenic paramyxovirus that affects many species of birds. The virus was first discovered in Indonesia in 1926. In 1927, an outbreak in poultry occurred near Newcastle, England, hence the name Newcastle Disease. Because the virus is very contagious and easily spread it can be devastating to commercial poultry operations. An outbreak in California between 1971 and 1973 cost the state 56 million dollars, and resulted in the destruction of about 12 million birds. Exotic Newcastle Disease is one reason why birds imported into the United States undergo a federal quarantine in order to test for END.

#### **Background**

Exotic Newcastle Disease was diagnosed in backyard poultry flock in Southern California on October 1, 2002. Subsequently San Bernadino, Los Angeles, and Riverside counties were quarantined. The disease was confirmed in a commercial poultry flock in Ramona around 30 December 2002 and then subsequently in Valley Center. Due to the highly contagious nature of the disease and the serious ramifications if the disease were to occur in our collection, measures are being taken to heighten our biosecurity. The policies outlined in this document will likely change as we learn more about the status of Exotic Newcastle Disease in San Diego County.

San Diego County is under a federal quarantine that regulates the movement of birds and bird products out of the quarantine zone. To comply with this quarantine all ZSSD bird movements out of the quarantine zone will be discontinued. Movement of birds within the quarantine zone may occur on a limited basis and will be dealt with on a case-by-case basis.

- Birds will not leave zoo grounds for educational programs.
- Transfers between the SDZ and WAP will be discontinued.

#### Potential sources of Exotic Newcastle Disease Virus

- **FOMITE:** A fomite is any inanimate object that mechanically transmits an infectious organism from one susceptible host to another. It has been well established that the spread of END is highly dependent on fomite transfer.
- **VISITORS:** can act as a fomites (examples include: shoes, clothing, hands, etc.). Visitors can also act as biological vectors, able to transmit the disease through inapparent infections of the eyes, nose and throat. In this case, the carrier is unaware of the infection.
- **EMPLOYEES:** can act as fomites and as biological carriers of the disease.
- **WILD BIRDS:** can act as fomites and biological vectors. In the 1971-73 outbreak, wild birds were not a significant feature in the spread of the disease from poultry ranch to poultry ranch.
- **OTHER:** vehicles driven on grounds, poultry products brought in for support of the collection.
- **VACCINATION:** Vaccination of wild birds for END is not an effective means of stopping END. In fact, vaccinating birds for END might actually induce the disease in some species that are susceptible to the live virus vaccine, and/or it could actually make it possible to transmit this disease to other institutions unknowingly. As a result, we will not attempt to vaccinate birds in the collection against END.
- **GOAL:** The specific goal of these protocols is to minimize exposure of birds in the collection to END.
- **FOCUS:** It is not reasonable to believe that we can achieve a 100% effective avoidance campaign against this and most other animal diseases. There is always some low risk of encountering an infectious organism that could devastate animal populations. Protocols like this are drafted to deal with situations. If situations change, protocols change to match the need. It is very important for all employees to realize that the protocols we draft are intended to minimize exposure risk to susceptible species as much as is reasonably possible without completely shutting down the operation, and to flexibly adapt

to changing situations so the goals of the protocols are maximized. If you have questions about the protocols, please let the curators/vets/pathologists know and we will try our best to explain the reasoning behind these protocols. Thank you for all the work you are doing to help protect the valuable birds in the collection!

#### Steps being taken to minimize risk of exposure:

##### Visitors acting as a fomite:

- Walk through aviaries have been closed to the public until further notice.
- Public contact with birds in the collection has been discontinued until further notice.
- The Rondavel pond has been fenced off until further notice to prevent waterfowl from accessing public walkways.

##### Actions to minimize employees acting as a fomit:

**FOOTBATHS:** all exhibits containing birds will have a footbath placed at the entrance for all employees to use prior to entering the area. The following disinfectants will be in footbaths:

**UNIFORMS:** Any employee (this includes all departments) entering an enclosure that contains birds should be wearing a ZSSD issued uniform according to the above description and zoo-dedicated shoes.

##### Free-ranging birds

We have minimal capability to control wild birds in Balboa Park. It is forbidden by federal law to disrupt the natural activities of free-ranging migratory birds without special permits. It is known that END is not significantly transmitted by wild birds, so we will control free-ranging birds as reasonably as possible to remain within federal statutes, and where it seems reasonable to help prevent END.

- The free-roaming peafowl and guinea fowl on zoo grounds are being captured and put into pens until further notice.
- All free-flighted bird programs will be temporarily discontinued except for the Wegeforth Bowl macaw free flight program. These animals are allowed to circle Wegeforth Bowl only because the management believes these animals are controllable enough that the risk this activity raises is reasonably low.

##### Other:

- The chick facility at the Children's Zoo will be closed until further notice.
- Vehicles driven onto zoo grounds will be disinfected.



## 2. RESPONSIBLE EMPLOYEES

Employees who work directly with birds, employees who have the potential to work with birds, employees entering bird enclosures, employees creating or otherwise working on items placed into bird enclosures, and employees handling food, forage and enrichment items pose the greatest risk to our bird collection. This "focus" group of employees includes the following employees: all employees in teams; Collection, Husbandry, and Science Department; Bird Department; Reptile Department; Horticulture; Construction and Maintenance; Water Quality; designated B&G employees; designated Education employees; designated Marketing employees; Behavior; Veterinary Services; Forage Warehouse. The following uniform policy applies to all the above employees. CRES researchers needing access to bird areas will wear zoo dedicated shoes and ZSSD coveralls.

## 3. UNIFORMS

Uniforms include ZSSD-issued pants, shorts, shirts, t-shirts, sweatshirts, jackets, and hats. Responsible Employees are not to wear uniforms home or take uniforms home to be worn to work the next day. Any outer footwear (shoes, boots) worn while working in bird enclosures should be zoo-dedicated and not leave zoo grounds.

Employees (as listed above) leaving zoo grounds during their workday:

For personal business (includes non-work related doctor's appointments): Employees should change out of zoo uniform/shoes prior to leaving and back into zoo uniform/shoes upon returning.

Zoo related business to non-animal facility:

This includes work-related doctor's appointments, airport shipment pick-up and delivery: Employees can wear zoo uniform/shoes but need to disinfect shoes upon returning to zoo.

Zoo-related business to animal facility:

This includes pet stores, feed stores, other institutions holding animals, and areas where other animals are brought for display or teaching purposes: Wear uniform but change into street shoes and change into clean uniform/zoo shoes upon returning to zoo grounds. Shipments where animals are being delivered or picked-up at an animal facility: To be evaluated on a case-by-case basis initially.

Many ZSSD employees have birds of their own. Additional measures should be taken to ensure that employees don't act as a fomite for virus

transmission from non-collection birds. It is important for these individuals owning birds at home to take the following preventive measures before leaving home for work:

- Shower and change into clean clothing prior to coming to work if you have been working with non-collection birds
- Wash your hands with soap and water (10-20 seconds) prior to starting work.

## 4. FOOTBATHS & SHOE DISINFECTION

**FOOTBATHS:** all exhibits containing birds will have a footbath placed at the entrance for all employees to use prior to entering the area. The following disinfectants will be used in footbaths: 1. Virkon S\* (potassium peroxymonosulfate) is a peroxygen disinfectant that works via oxidation. It is currently being used by the USDA for Newcastle disease.

OR

2. One Stroke Environs\* is a phenolic disinfectant currently used in other areas of the zoo. It will also kill the Newcastle disease virus.

In areas where a footbath is not feasible the following are other options include:

1. Dedicated boots for a particular exhibit 2. Fullsan\* spray (a phenolic disinfectant) sprayed to the bottoms of shoes/boots; as for footbaths employees need to remove debris from the bottoms of footwear prior to using the spray.

In areas that contain multiple enclosures serviced by a discrete entrance/exit a footbath may be utilized at the entrances to these areas rather than at each individual enclosure within the contained area. Please consult with your supervisor if clarification is required.

### Additional disinfection of shoes

Responsible employees from the designated departments (see item 2 above) should spray their feet with Fullsan\* spray or use the provided footbaths when entering the zoo. Footbaths will be used in areas of high foot traffic. Designated employees should not use the Warner Gate entrance because foot disinfection is not available. Employees concerned about animals at home can also spray their feet/use the footbath upon leaving the zoo. Employees from other departments are encouraged to also disinfect their feet when coming to work.

### PROPER USE OF FOOTBATHS

In order for any disinfectant to be effective the surface being disinfected needs to be free from debris build-up.

1. Brush, wipe, or scrape debris from bottoms of footwear.

2. Step into the footbath. If sponge footbath inserts are not available to reduce the amount of liquid on feet after exiting have a second tub containing a towel to absorb excess moisture
3. Footbaths are to be changed daily. If during the course of a day a footbath becomes excessively soiled or diluted out due to rain it should be changed again.

## **5. VEHICLE DECONTAMINATION**

All vehicles entering the zoo grounds will have the tires and wheel wells sprayed with the disinfectant, Virkon S®.

In the interest of efficiency, vehicles operating from the Zoo and remaining within the immediate vicinity will not need to be decontaminated with each entry. The "immediate vicinity" is defined as:

- Richmond Street gate north to Upas.
- Richmond St. East on Upas to Park Blvd.
- Park Blvd South to Village Place
- Village Place/Old Globe Way to CRES
- 

Vehicles operating north of Upas, East of Park Blvd and South of Village Place will need to be decontaminated upon re-entry to Zoo grounds. Vehicles parking in the Richmond Street lot will need to be decontaminated if they are returning to the Zoo from outside the immediate vicinity. Vehicles parking in the zoo hospital parking lot as a courtesy for Old Globe Theater employees do not need to be decontaminated, because they do not access or enter any of the animal areas. In this way their vehicles are identical to regular zoo visitors, and the ZSSD personnel using the parking lot at this time – none of these vehicles are being sprayed with disinfectant.

## **6. DELIVERY OF BIRDS/MAMMALS/REPTILE TO NECROPSY**

Should a Newcastle virus infected bird die without knowledge of the infection it would be a source of virus for anyone working in or going into the necropsy room. If when delivering a body to necropsy the infectious disease sign and yellow chain are across the door (meaning a necropsy is in process or the room has not been disinfected) please use the outside access door to the walk-in cooler. This door is located on the other side of the walk-through door that accesses the hospital parking lot (adjacent to pathology); the door lock uses the same key as necropsy. There will be a box in the cooler to place pink slips. Contact pathology (4484) if assistance is needed for delivery of large bodies. If the infectious disease sign and yellow chain are not across the necropsy entryway then bodies can be delivered as usual.

Non-collection birds found dead on zoo grounds should be delivered to necropsy with a pink sheet describing where the bird was found and any circumstances regarding the death

## **7. BIRD ESCAPES**

Any bird that escapes and leaves the zoo grounds will undergo a 30-day quarantine at the hospital. The bird will be tested for END while in quarantine.

## **8. BEHIND THE SCENES TOURS**

Behind the scene tours of the Forage Warehouse have been postponed until further notice. Behind the scene tours of Tiger River Trail will continue however visitors will be required to use a footbath prior to entering the area.

## **9. VISITORS, OBSERVERS, VISIT-A-JOB PROGRAM**

The San Diego Zoo has ongoing visitor/observation opportunities that overall positively impact wild animal management. Until further notice, the following will be required before visitors and observers can participate in the collection.

- Any visitor or observer must not have visited a facility housing avian species outside of the San Diego Zoo collection in a 24 hour period prior to visiting the San Diego Zoo as an observer.
- Any visitor or observer must obey the same precautions as responsible employees.
- Visitors or observers may not take up lodging at a commercial poultry facility, private poultry facility, or private aviary while visiting the zoo. For the purposes of this protocol, an aviary is defined as any household or other facility housing more than 3 avian species on the premises.
- Visitors or observers may not visit a poultry facility or aviary that is not associated with the ZSSD while visiting the zoo.

### **Outside contractors:**

Work in bird areas requiring outside contractors should be delayed until the quarantine is lifted. If this is not possible, then any visitor must be queried as to recent exposure to poultry or other bird species before being allowed to proceed with contract work. If there is any doubt about whether a contractor should or should not be allowed to engage in activity inside the zoo grounds, contact Pat Morris, Meg Sutherland-Smith or Ed Lewins for clarification before allowing the person(s) access to zoo grounds. If it is necessary to enter a bird area, the visitor must clean and disinfect footwear (footbath, spray, or shoe covers) and have outerwear in place (e.g. ZSSD-supplied disposable coveralls).



## **10. Guidelines for supervisors should an employee report that they have either a sick bird or a bird that has died recently.**

Employees who care for birds, have the potential to care for birds in his/her daily routine, have to enter bird enclosures, and/or work with forage items and CANNOT be reassigned to other duties:

1. The employee will be asked to stay home for the day. The employee needs to be reachable by phone. Obtain a phone number where employee can be reached. The employee will be contacted by someone in either the Bird Department, Curators, Veterinary Services or Pathology to discuss circumstances of bird death/illness by 10 AM (assuming a 6 AM start keeper). Supervisors will be notified later in the day regarding the status for that employee returning to work the following day.

2. Employees who can be reassigned or do not have direct or indirect bird contact (eg. most mammal keepers, most reptile keepers, and most team employees)

Report to work after showering and changing into clean clothes. No bird contact after showering/change into clean clothes. Shower again after reporting to work.

The employee will be contacted by someone in either the Bird Department, Curators, Veterinary Services or Pathology to discuss circumstances of the bird death/illness.

In either instance, supervisors should notify either Bird 1, Bird 2, or Bird 3 of the situation and provide phone number where employee can be reached. Keepers working at the Avian Propagation Center should notify Pat Witman.

Supervisors: If you are contacted by an employee with a sick or dead bird issue, call either Pat Morris, Meg Sutherland-Smith or Ed Lewins for further instruction – one of these three persons will call the employee back and interview the employee on the specifics of the situation.

If the employee asks for a source for END information refer them to the following website: [www.cdfa.ca.gov](http://www.cdfa.ca.gov)

**UNDER NO CIRCUMSTANCES** is an employee to bring in a dead bird from home or anywhere outside of the zoo grounds to pathology for testing.

## **11. Bird enrichment:**

Bird Toys - All bird toys purchased for enrichment should be disinfected. Immerse in a bleach solution (as stated for footbaths) and remove; allow to sit for 5 minutes then rinse and allow to dry.

Wegeforth Bowl - In order to prevent abnormal behaviors in the free-flighted macaws a compromise for allowing the birds some exercise has been developed. The birds will be allowed to fly circles within Wegeforth bowl. The public will not have access to the amphitheater during the bird flights.

## **12. Use of blowers around bird exhibits.**

Until further notice, backpack blowers are not to be used in front of or around any bird enclosures.

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## **4th International Seminar on Keeping Otters in Captivity**

For the fourth time, after 1997, 1999, and 2001, the German Association for Otter Conservation [Aktion Fischotterschutz e.V.] offers an international seminar on keeping otters in captivity. This will be held on 8-10 October, 2003 at the German Otter Centre at Hankensbuettel (1 hour east of Hanover). The seminar will cover all aspects of keeping otters, inclusive construction and design of exhibits/enclosures, transport, diet, breeding and veterinary care.

Four species will be in the foreground: the Eurasian Otter, The North American River Otter, the Small-clawed Otter, and the Giant Otter. All lecturers have many years of practical and specific experience with otters in captivity, having published husbandry guidelines or being studbook keepers for these species. For the first time an optional excursion (1-2 days) to different German otter keeping facilities is offered as a post-seminar tour.

The seminar will start on 8 October at 1000 h and will be finished on 10 October at 1600 h (the optional post-seminar tour will take place on 11 October and probably on 12 October). The participation fee is 405 EURO including the registration fee, accommodation (in double rooms), all meals, shuttle service, and hand outs. The seminar will be held in English.

More information and the detailed program is available for viewing on the website <http://www.otterzentrum.de> or can be ordered via e-mail from [afs@otterzentrum.de](mailto:afs@otterzentrum.de) Registration should be made as soon as possible, because places are limited and will be reserved on a first come first serve basis.



# REACTIONS

## *A Question and Answer Forum for the Zoo Professional on Crisis Management*

*By William K. Baker, Jr., Curator  
Little Rock Zoo, Little Rock, AR*

### **Question**

Can aquariums have crisis events?

### **Comments**

Historically, aquariums and aquatic facilities maintained collections that were composed mainly of various species of fish. This meant that the opportunities for direct contact with a specimen was low and always begged the uninformed question, "Crisis, what do you mean, is a fish going to escape or what?" However, in recent years that has changed.

Aquatic facilities have undergone changes similar to zoological institutions in order to provide a more diversified experience for the visitor. This diversification of the animal collection has led to the inclusion of mammals, birds, reptiles, amphibians, and invertebrates. The aquatic park experience no longer means "just fish". As a result, aquatic facilities are subject to many of the same crisis management situations that their zoological counterparts encounter.

Examples of this would include damage to holding units from an earthquake, staff personnel injured by a speedboat, staff personnel injured by marine mammals during public training demonstrations, a collapsed catwalk, visitors in shark tanks, and incidents at petting tanks. Some of these I have even witnessed myself. The point to all of this is that the crisis management situation can strike unexpectedly at any zoological institution, whether they are aquatic or terrestrial in nature. The zoological profession often requires us to come into close proximity to animals for various reasons. The daily care, management, and training of animals all have an associated degree of risk. Yet, as zoological professionals we accept this risk in order to pursue our chosen profession. By being aware of the risks, we have taken a step forward in attitude and safety.

### *CMS Awareness in Aquariums and Aquatic Facilities*

#### **Zoological**

1. **Dangerous Animal Escapes** – I'll be the first to admit that an escaped fish wouldn't be a serious problem, (barring incidents with poisonous fish). However large reptiles such as



alligators, crocodiles, venomous snakes, or an aggressive seal or sea lion could cause problems.

2. Human-Animal Interaction – This can be a definite problem for aquatic facilities. I remember as a child watching an adult reach over a Plexiglas™ barrier with his leg to retrieve his daughter's doll from the shark tank at feeding time. The staff members pulled him back just as the doll disappeared into a lemon shark that was surface feeding. Expect the worst. The fish can't come to the public, but the public can come to the fish. Also, don't forget accidents happen during training sessions too, (nips, bites, and body slams). Many facilities maintain collections of coral, venomous fish and reptiles (lion fish, stone fish, and sea snakes). Remember, all of the hazards of diving the reef are in that salt-water tank.
3. Outbreak – It all depends on what animals are in the collection and how zoonotic the pathogen is. Pay special attention to reptiles (Salmonella) and primates (Ebola).

#### Natural Disaster

1. An aquatic facility is vulnerable to all of the forces of nature. There is also the factor of increased animal mortality. If containment is lost on a terrestrial exhibit then the animal is recaptured. If tank integrity is lost, then it's a race to recover the specimen before it dies. Back-up holding areas are a must.

#### Manmade Disaster

1. Facility and equipment maintenance can prevent problems with filtration systems, ozonators, and structural integrity. It's important to remember that if a tank loses structural integrity that a lot of water and Plexiglas™ are going to be airborne, which could be a real safety concern. If staff members are dive-certified and it's part of their job description, then remember dive safety and the associated dangers of barotraumas, decompression sickness, and arterial gas embolism. Hazardous materials spills can be a problem when working with acids, bases, and other chemical compounds making SCBA's, haz-mat kits, and hazardous environment flashlights a must. Also, don't forget bomb threats and acts of terrorism. It only takes one person with an agenda to shut your facility down with a phone call. Remember, terrorism is the ultimate variable reinforcer.

Short version to all of this: Yes, crisis events can happen at aquariums and marine park facilities.

**Next Month:** Do you have any recommendations for climbing and fall safety in the zoo environment?

**If you would like to submit a question for this column or have comments on previously published materials, please send them to AAZK, Inc., 3601 S.W. 29th St., Suite 133, Topeka, KS 66614 Attn: Reactions/AKF**

(About the Author: Since 1985 Bill has been active in the fields of science, zoology, and wildlife management. His education and experience include a B.S. in wildlife management and post-graduate studies in zoology, Lab and Museum Assistant, Shoot Team Leader, ERT Member, Large Mammal Keeper, Senior Keeper, and Zoo Curator at various zoological facilities. His area of research is crisis management in zoological institutions, which draws upon practical experience and training as a Rescue Diver, Hunter Safety Instructor, NRA Firearms Instructor, and Red Cross CPR/First Aid Instructor.)

# Increasing Activity Levels in Captive Elephants: 'Spread' (is) the Word

*By Mike Carpenter, Elephant Keeper  
The Oakland Zoo, Oakland, CA*



One of the most common challenges in elephant management is maintaining healthy activity levels to ensure mental and physical stimulation. Ideally we would all like to have acres and acres of naturalistic habitat, but the reality is that most institutions have limited resources and/or the necessary space to expand. A large area offers obvious benefits, but the size of the enclosure is only part of the solution. If the exhibit isn't dynamic, then it becomes an expanse of boredom. The primary concern of animal welfare isn't the only matter at stake; a facility also risks a poor reflection on its principles and moral obligation to provide for the animals in its charge. The modern message of conservation and education is somewhat corrupted when visitors see an elephant swaying, bobbing, or some other type of unnatural stereotypic behavior because they are not being kept 'busy'.

Even with the increased availability of enrichment resources in captive animal care, it takes considerable effort to constantly implement new and exciting enrichment that is continually stimulating. In conjunction with other enrichment projects, the Oakland Zoo's elephant program employed an efficient system called a 'spread'.

The idea of a spread is basically a modified scatter feed. Instead of piling every feeding in front of the elephant, grain, hay, produce, browse and other items are distributed in small amounts around an enclosure to promote natural foraging, grazing and browsing behaviors. Items can be hidden, buried, placed in high areas such as trees or rocks to encourage range of motion, or in and around a water feature to initiate bathing or play. Not only is it enriching for your elephants, but a far more informative experience for zoo guests to see the act of *natural* behavior.

The system works like this:

The elephants are shifted off the exhibit into a holding area where they are given a small feeding as reinforcement and to keep them occupied. Keepers then enter the exhibit and disperse the items. Each piece of food is distributed in a way that an elephant would have to take another step in order to get to the next piece. Hay is dispersed in handfuls in the same manner and browse is hung with chains in multiple locations. The benefit is that in getting the food, a far greater amount of energy is expended than would have been if the feeding had been given on station. Consequently, the elephants are occupied for much longer periods of time. You do not have to alter the amount of food in a diet.



The activity level of the elephants determines the spread schedule. The size of the exhibit and number of animals are key in establishing this. In our system we have found that it is generally an hour and a half until our herd is bored, and our timetable is set accordingly. Also, it is important to allow some flexibility in the schedule so not to interrupt desirable activity or prolong unwanted behaviors.

Our spreads consist of five elements, four of which are constants: hay, browse, produce, and grain (or pellets as they are sometimes called). The fifth component consists of multiple enrichment items and varies according to a schedule (see Figure 1).

**Figure 1. Spread Enrichment Schedule**

Day_ Time_	Monday, Thursday	Tuesday, Friday, Sunday	Wednesday, Saturday
1015	<ul style="list-style-type: none"><li>• Fresh dirt piles</li><li>• Perfume</li><li>• Sauerkraut</li><li>• Apple cubes</li><li>• Drill holes</li><li>• Move dirt</li></ul>	<ul style="list-style-type: none"><li>• Shavings piles</li><li>• Herbs</li><li>• Pellet barrels</li><li>• Peanut butter</li><li>• Dried Fruit</li></ul>	<ul style="list-style-type: none"><li>• Straw piles</li><li>• Air freshener</li><li>• Ketchup</li><li>• Burry Potatoes, apples or carrots</li><li>• Hay barrels</li></ul>
1145	<ul style="list-style-type: none"><li>• Salt</li><li>• Bran mash</li><li>• Dried fruit</li></ul>	<ul style="list-style-type: none"><li>• Relish</li><li>• Alfalfa</li><li>• Popcorn</li></ul>	<ul style="list-style-type: none"><li>• Jelly</li><li>• Cereal</li><li>• Apple cubes</li></ul>
1330	<ul style="list-style-type: none"><li>• Popsicles</li><li>• Grain</li><li>• Weeds</li></ul>	<ul style="list-style-type: none"><li>• Ice</li><li>• Mustard</li><li>• Grass</li></ul>	<ul style="list-style-type: none"><li>• Popsicle</li><li>• Apple sauce</li><li>• Bark</li></ul>
1445	<ul style="list-style-type: none"><li>• Treat box</li><li>• Apple cubes</li><li>• Eucalyptus bark</li></ul>	<ul style="list-style-type: none"><li>• Treat tubes</li><li>• Alfalfa cubes</li><li>• Weeds</li></ul>	<ul style="list-style-type: none"><li>• Treat bag</li><li>• Sweet grain</li><li>• Grass</li></ul>
1600	<ul style="list-style-type: none"><li>• Jelly</li><li>• Alfalfa</li><li>• Ketchup</li></ul>	<ul style="list-style-type: none"><li>• Peanut Butter</li><li>• Relish</li><li>• Popcorn</li></ul>	<ul style="list-style-type: none"><li>• Bran Mash</li><li>• Sauerkraut</li><li>• Dried fruit</li></ul>

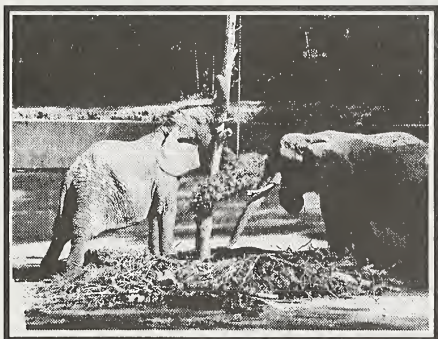
Items such as peanut butter, jelly, ketchup, mustard, sauerkraut, and relish are dispensed in quarter-sized dabs on locations off of the ground. The number of applications should be limited so that the novelty of an item does not diminish. Pellets and grain are scattered individually to encourage foraging. Instead of distributing hay in flakes, handfuls can be allocated around the entire enclosure. In general, the more widespread the food and enrichment, the more the likelihood of increased activity.

The amount of time spent to prepare a spread ranges from less than five minutes to fifteen, depending on the ingredients. Keeping a supply of browse on hand of course requires additional time and so does securing fresh bark, grasses, and weeds.

The actual execution of a spread takes an average of only fifteen minutes from start to finish, and often less than ten minutes when staffing permits. Understandably, it is important to limit the amount

of time that the elephants are off-exhibit for the benefit of zoo guests. Incorporating signage to inform your guests about what is taking place is very helpful. We have found that our members and returning visitors rather enjoy watching us do a spread and often plan their day according to the posted spread schedule. Whenever we are asked, "Where are the elephants?" our guests are pleased to discover what is occurring and are excited to see the impending feeding activity. Both public and elephant are engaged for a longer period of time, a win-win situation.

Shifting elephants off-exhibit and back six times a day compared with once or twice has its time commitments, but it also increases the activity *in addition to spreads*. In the last several years, we have expanded the number of spreads and have seen it pay off when the elephants step onto the scales, in reducing stereotypic behavior, and also in traveling-distance research (Gilbert, 2002). Other variables such as using available elevation changes also boost fitness. We know that it takes more energy to go up a hill than walking on flat ground. Our elephants go down a hill and up another and then repeat the process to get back to the exhibit, giving them a good workout in between spreads. Keeping it positive with small food rewards, such as a scoop of low-cal bran mash, at an off-exhibit station promotes reliable movement. You can also conduct 'mini training sessions', asking for a few behaviors in return for the food reward once they reach their station. This also adds to the exercise regime. Despite the considerable course that our herd navigates, a well-known training consultant remarked that he "hadn't seen elephants shift any better than that."



Spreads can be modified and instituted in most any program, free or protected contact. They permit elephants to be elephants - to forage, browse, graze, and so on. They are non-invasive and reduce stress in addition to improving physical condition, all while being very popular with your guests. Spreads can also be adapted to off-exhibit areas, barns and stall enclosures, enriching elephants around the clock and year-round. Chaining up browse and feeding out hay, grain, and produce in puzzle or barrel feeders keeps them engaged longer while inside rather than just

dropping it in front of them. There are truly no limits to the number of feeding strategies you can use in a spread. Remember, there is no such thing as too much enrichment! Combined with other enrichment ideas, spreads are the road to happier and healthier elephants.

## Reference:

Gilbert, Greg. "Elephant Observations: A Tool to a More Effective Elephant Program"  
2002 EMA Conference Proceedings

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## Elephant Nature Park Relocates

The Elephant Nature Park has re-located to a new, larger home. A beautiful valley with a river running through it, the area in Mae Taeng, Northern Thailand is a perfect natural place for the ever-growing herd and .. with well over 100 acres there is plenty of space for them to move around.

View pictures and story at the following URL:

<http://www.thaifocus.com/elephant/index.htm>



# The Water Column

By

*Dan Conklin, Senior Biologist, Florida Aquarium  
Bruce Elkins, Curator of Waters, Indianapolis Zoo  
Kevin Shelton, Associate Curator, Florida Aquarium*

## Effects of Temperature on Aquatic Systems

The importance of temperature on aquatic systems would seem to be a no brainer and in normal operation it is. Make sure the temperature is within the normal range for the animals and/or plants you are keeping and you are done with that parameter for the day.

In actuality, temperature is a much more dynamic quality of water than that. It controls metabolic rates in animals, the speed of chemical reaction in the water, concentrations of dissolved gasses (especially oxygen), reproduction rates of some pathogens, and numerous other variables.

Temperature is measured in one of three scales. There is the Fahrenheit scale (F°) which has the freezing point of freshwater at 32° and the boiling point at 212°. This was the first scale invented and is based on a 180° difference between the freezing point and boiling points of water (1/2 a circle). While most of us grew up with this system it is unwieldy for calculations and conversions. The second scale used throughout Europe and by most of the scientists is the Celsius system. The Celsius system sets the freezing point of water at 0° and the boiling point at 100°. Obviously, the degree size itself must be different between the Fahrenheit scale and the Celsius scale. The Celsius degree is 1.8 times larger than the Fahrenheit degree. Since the scale is also offset by 32 degrees we get a conversion of " $(F-32)/1.8 = C$ " or conversely, " $(C \times 1.8) + 32 = F$ ". So we begin to see why most people are moving to the Celsius system only. *Side note: There are literally hundreds of programs on the Internet that will do these conversions for you.* The third scale is the Kelvin scale and is based on the motion in matter. At -273 °C all motion in matter stops and this is assigned as 0° Kelvin. The Kelvin scale uses the same size degree as Celsius but the scale is shifted down 273 points. It is primarily used by physicists and chemists.

So how is temperature important to animal keepers?

First are normal metabolic rates of the animals in our care. While most fish can tolerate a wide range of temperature variation, higher temps cause their metabolic rates to increase. A general rule of thumb is that a 10°C increase in temperature will double the metabolic rate. Fish at higher than normal temperatures (within reason) will grow faster, move faster and eat more. They will also die sooner, breed less well (if at all) and be more susceptible to disease. Temperature shifts can also cause problems. To high a shift will cause the animals to go into thermal stress and can even lead to

death. Temperature shifts downward are general not as bad but too cold a temperature can slow the metabolic rate down to the point where the fish cannot generate enough energy for itself.

Temperature also controls the amount of dissolved oxygen available to your animals. This is very important for cold water animals that rely on a high oxygen level in the water. Rainbow trout, for example, are more sensitive to oxygen deprivation than to fluctuations in temperature. But higher temperature water will not hold as much dissolved oxygen as colder water and trout that are too warm will use more oxygen than normal temperature ones. So it becomes just as essential to keep trout in cold water for the oxygen demand as it is for the metabolic rates of the fish.

Temperature can also be used to help control pathogens. Protozoa in particular are susceptible to temperature. *Ichthyophthirius multifiliis*, the cause of the freshwater white spot disease or "ich" is often treated by raising the water temperature several degrees above normal. This causes a reduction in the life span of the free swimming infectious stage and decreases the likely hold of them finding another fish host. *Amyloodinium ocellatum* (saltwater velvet) infections can be reduced, but not cured, by lowering the temperature several degrees. The lower temperature helps to retard the development of the infectious dinospore stage of the organism.

Finally, I wanted to mention the effect temperature will have on the bacteria growth for biological filtration. As with most of what I have mentioned, the lower the temperature the slower metabolic rates will be. This is very true for the bacterial growth of the biological filters. Anecdotally, I have found that a 10° reduction in temperature can almost double the time needed for a filter to cycle. Further, a coldwater system, such as a rainbow trout tank kept at 10°C seems to take forever to cycle (actually three months, last time we did it, a long time when you are waiting to put fish in the tank). Increasing the water temperature can speed up the cycle time... to a point. Once you begin to get water temperatures above 30°C the process slows again. My guess is that oxygen, again, becomes a limiting factor.

Temperature is often taken for granted but it is one of the most important aspects of the water we check. So, watch your thermometers.

## References

- Moe, Martin A. 1989. The Marine Aquarium Reference: Systems and Invertebrates.  
Green Turtle Publications. Plantation, FL 507 pp.
- Gratzek, John B. et al. 1992. Aquariology: the science of fish health management.  
Tetra Press. Morris Plains, NJ 330 pp.

A quick reminder: The authors of the Water Column are always willing to answer any questions you might have. They can be about filtration systems, water chemistry, or aquatic life. If we don't know, we will find out for you! We also welcome feedback from readers about previously published columns. Questions and comments may be submitted to us by email at:

Dan: [dconklin@flaquarium.org/](mailto:dconklin@flaquarium.org/)  
Kevin: [kshelton@flaquarium.org/](mailto:kshelton@flaquarium.org/)  
Bruce: [belkins@indyzoology.com/](mailto:belkins@indyzoology.com/)

Or by mail at: Kevin Shelton, The Florida Aquarium, 701 Channelside Drive, Tampa, FL 33602.



# Providing a Means for Chimps to Pass to Keepers "Foreign" Objects Found in Their Exhibit

*By Val Beardsley, Senior Keeper  
Dallas Zoo, Dallas Texas*

## Introduction

With open, naturalistic exhibits and visitor areas near the perimeter of such an exhibit, an occasional object such as a soda can, a plastic bottle, or a child's toy can become *unintended* chimp enrichment. Although such items may provide a few moments of fun and excitement for the chimps, there is of course the potential for such an object to become harmful to them.

The Dallas Zoo houses 3.5 common chimpanzees (*Pan troglodytes*). A number of the chimps have become familiar with the concept of trading small items to keepers through the 2" x 2" (5.08cm x 5.08cm) cage mesh. This is a relatively easy thing to teach chimps, as it seems almost a natural tendency for them. Simply rewarding that behavior a few times gives them the idea. Further shaping can be done by using positive reinforcement techniques.

Our large outside exhibit adjoins an indoor holding building that has three mesh transfer chutes extending across a small enclosed outside keeper area. The chutes are constructed of 2"x 2" (5.08cm x 5.08cm) steel mesh like their indoor holding, and this is the only contact area between keepers and the chimps when they are closed out of the building. Any potential trading of objects was limited to what would pass through a 2" x 2" (5.08cm x 5.08cm) opening.

## The Challenge

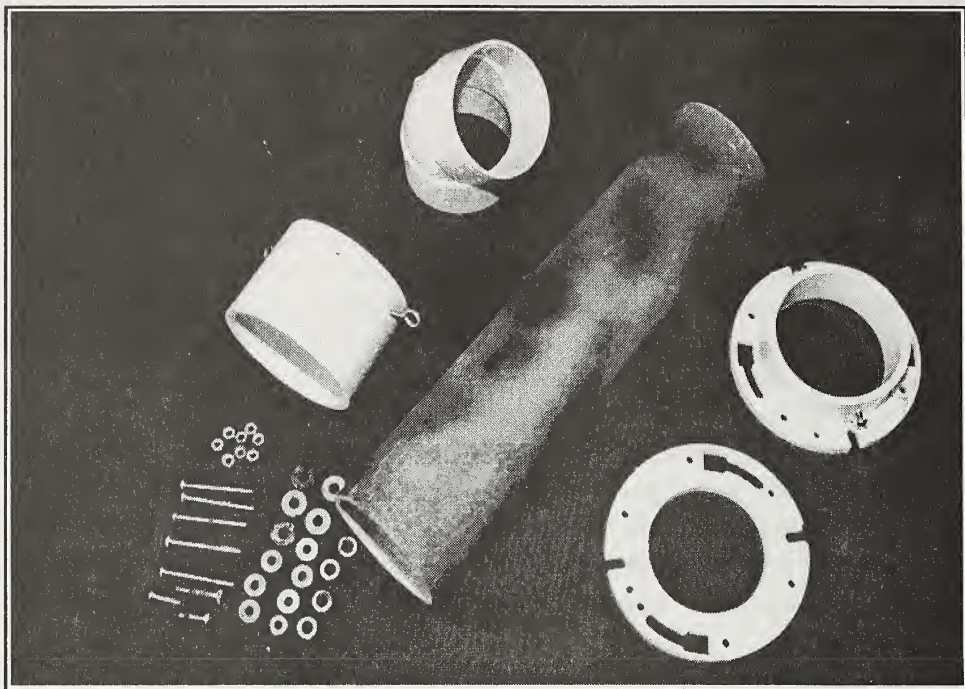
Design and build a device that would be sturdy enough for chimps and that could be attached to one of the transfer chutes with minimal modification, to allow the chimps to SAFELY pass larger objects from the exhibit to keepers. Simply cutting a larger hole in the mesh would certainly allow the chimps to put such items through, but it would allow their hands and arms to reach through as well -- an obvious safety issue.

## An Additional Challenge

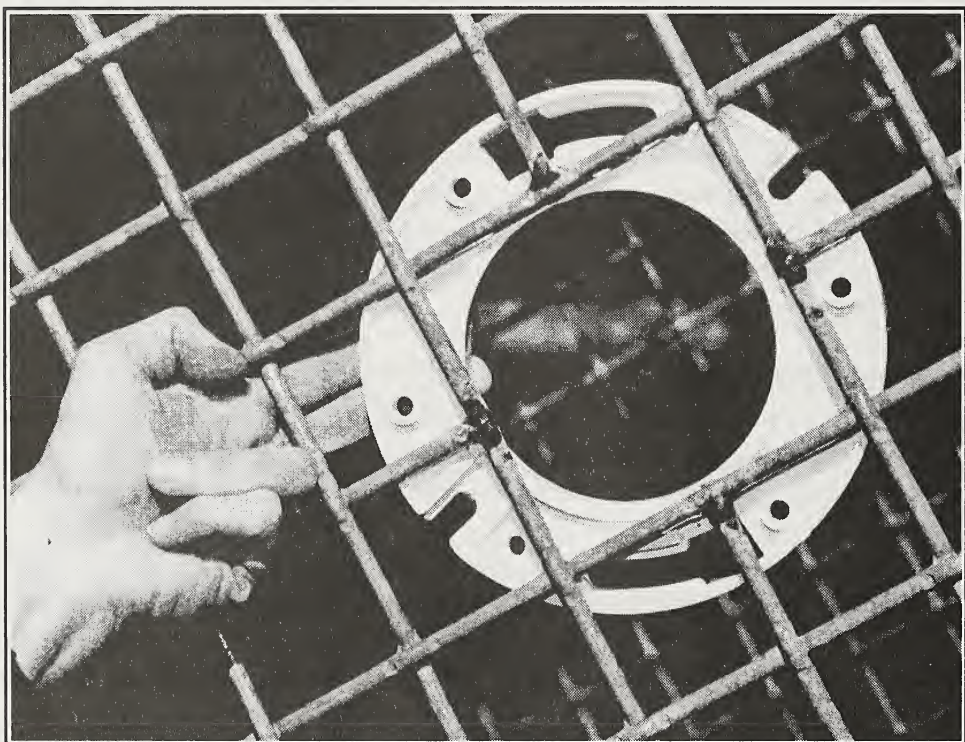
Train the chimps to recognize the purpose of this device and to respond appropriately when asked. The chimps' familiarity with the trading concept was an advantage, as was the fact that most of them seem to know when something does not belong in their enclosure.

## The Device

This was designed, constructed and installed by the author, a Sr. Keeper / Trainer. It consists of four PVC plumbing fittings and a few nuts and bolts. It was necessary to cut a larger opening in the 2x2" (5.08cm x 5.08cm) mesh to accommodate the fittings, and this was done by one of our able construction staff welders.

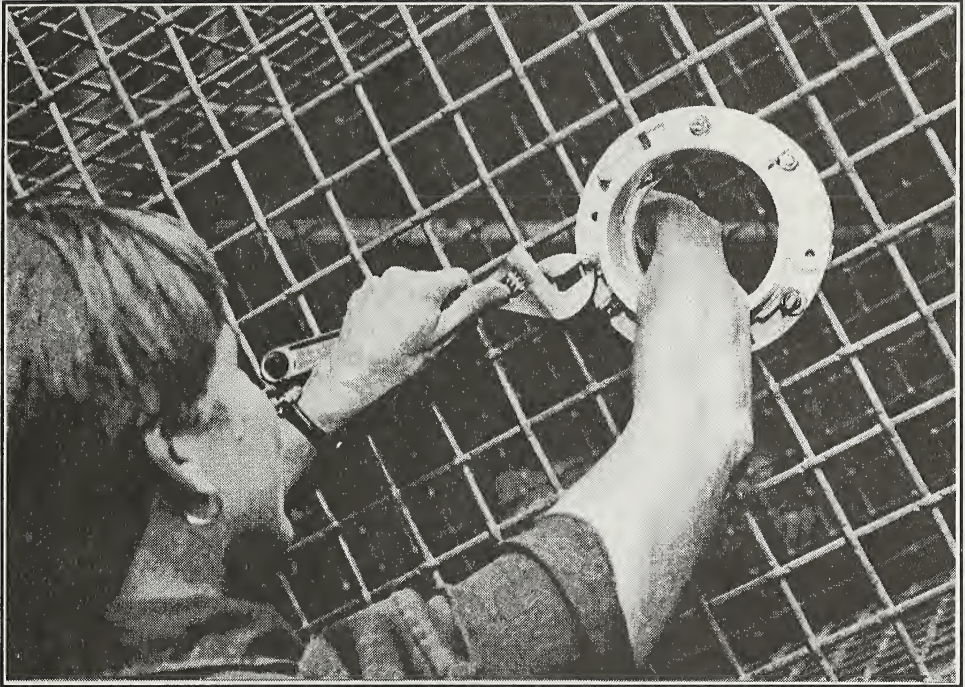


**Photo #1: PVC fittings and hardware used for Hopper assembly** *(Photo by Cathy Burkey)*



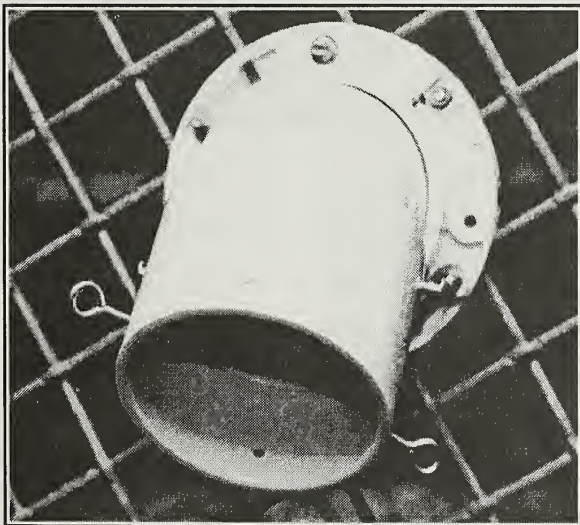
**Photo #2: Small part of caging cut and first PVC flange placed inside.** *(Photo by Cathy Burkey)*





**Photo #3: Second PVC flange placed on outside of caging and secured to first with six bolts, nuts and washers. (Photo by Cathy Burkey)**

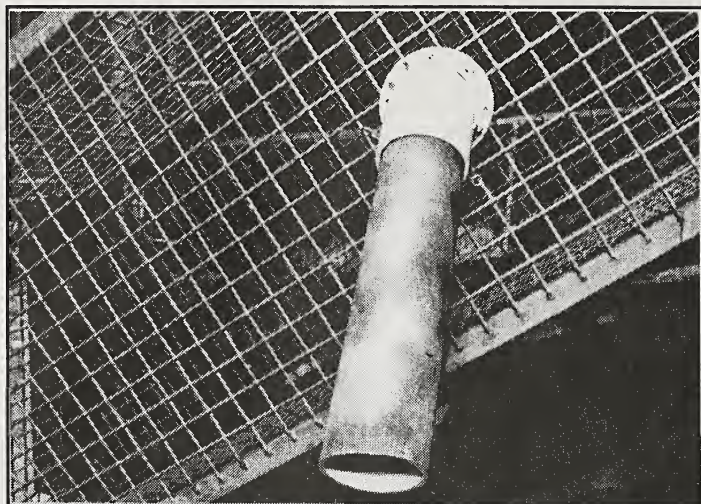
Two 4" (10.16cm) PVC commode flanges were bolted together on each side of the mesh opening, with the collar extending outward from the caging. A 35-degree elbow was attached to this, and an 18" (45.72cm) length of 4" (10.16cm) PVC drainpipe was added to extend the safety zone.



**Photo #4. Elbow section is fit to flange assembly and secured with two bolts from the inside, nuts on the outside. Holes were drilled in place through both pieces. (Photo by Cathy Burkey)**



**Photo #5: Length of PVC drainpipe added, eyebolts secure it (visible in Photo #4) (Photo by Cathy Burkey)**



**Photo #6: Side view of completed assembly. Exhibit in background. (Photo by Cathy Burkey)**

The Cost of this device was about \$22.00 but could even be less with found parts.

### **The Training**

Since the *trade* concept was already well established for some of the chimps, it was readily adapted to this variation. First, all the chimps were given access to the transfer chute containing the newly installed HOPPER and encouraged to investigate it thoroughly.

Next, plastic trade blocks and other small items were passed through the mesh to one chimp or another and they were encouraged to drop them into the hopper. Positive reinforcement was used from the start, so successful attempts were generously rewarded. As one chimp was rewarded,

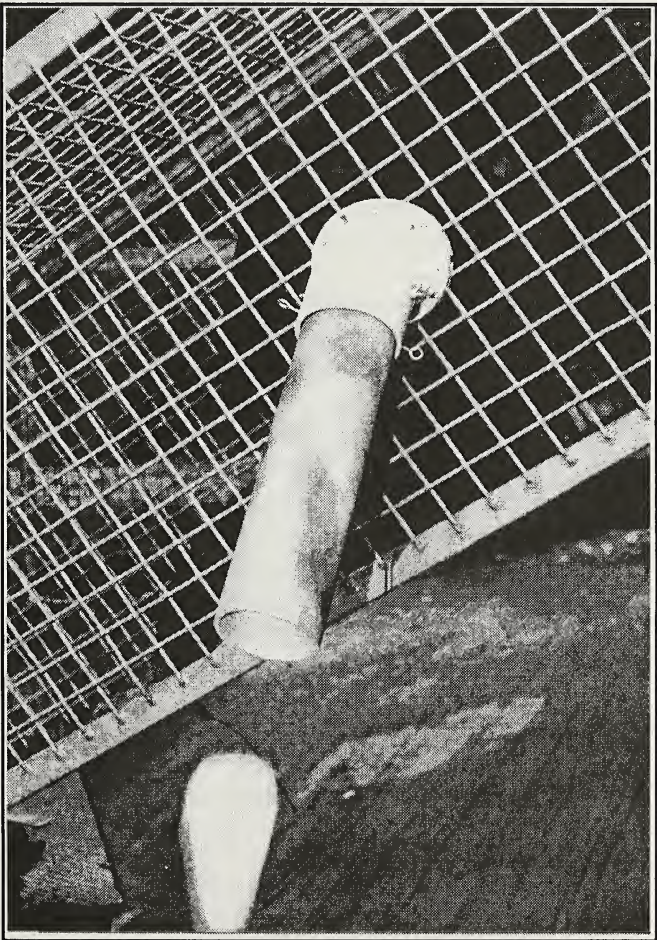


another was watching closely and was soon successful as well. Passing an item through the mesh to a chimp, however, and asking them to **not** pass it back the same way but, instead, to drop it into the new hopper took several tries to achieve success.

Their very first efforts, recorded on videotape, show quick understanding with increasing reliability on the part of at least three individuals.

In order to test with objects larger than 2" (5.08cm), it was necessary to bait the exhibit. Four different items were used the first time, and included plastic containers of differing shapes and colors plus a large plastic hose nozzle. These were put in place prior to sending the chimps outside in the morning.

In the beginning, these "retrieve" items were placed near enough to the transfer chutes and keeper area that positive reinforcement could be quickly applied when a target item was touched. The command "Bring it in" was introduced and very quickly responded to by one individual in particular. Two others soon met her reliability. On the first day of this trial, three of the objects were retrieved and deposited into the hopper shortly after being found. The fourth was carried off by a playful youngster but was successfully retrieved later in the day. A number of successful retrievals followed over time, strengthening the behavior.



**Photo #7: Hooper being used by a chimp. Plastic bottle dropping from end.**  
*(Photo by Cathy Burkey)*

## Some Anecdotal Comments

- Only three days after introducing this new training-as-enrichment concept, a film crew from Animal Planet® happened along. Captured was some early but quite successful use of this new device for a segment on animal intelligence. The chimps performed brilliantly, even with such a new activity, and strangers with cameras and a lot of equipment. Two chimps actually returned items from a great distance away.
- To make the task more challenging, object discrimination was added.
  - One set of retrieve items for placement in the exhibit has a duplicate set kept where trainer can easily access them. The intent here is for the trainer to take one item in hand, direct a chimp to retrieve the matching item, bring it into the chute and deposit it in the hopper.
  - The command for this has been “Get same”, and has been successful with just one individual so far.
  - Two siblings initiated a cooperative retrieval.

Subjects: Chloe, age 9 at the time, and her small brother KC, then age 4.

A chimp carried a plastic bottle (enrichment) from their night quarters into the outside exhibit with morning shifting, and it soon disappeared. Later in the day, with available training time, the three transfer chutes were opened up at the exhibit end, including the one with the new trade hopper. The chimps showed up as is usual when this is done, with several of them crowding around the new hopper.

When Chloe, an “established trader”, appeared in an adjacent chute, she was shown one of the duplicate training objects that resembled the syrup bottle. And she was given the command “Find same”, whereupon she dashed out of the chute and continued deliberate searching activity until she came upon the bottle. It should be mentioned that ours is a rather large and heavily planted exhibit. But Chloe found the target item and headed in with it. She was doing what had been asked of her. However, being intimidated by the gang-up of individuals near the hopper at that moment, she stalled, appearing disinterested. Then she got the attention of her little brother. KC’s usual behavior is to grab such a prize and run off with it or play Keep-Away. Instead, Chloe very purposely handed the bottle to KC and he brought it into the chute, past two adults, and dropped it into the hopper. At the same time, Chloe ran into the neighboring chute - her goal accomplished. There were BIG rewards for both. Had Chloe understood the goal and used an accomplice to achieve it? Did she communicate something to KC? Or was it all just happenstance?

### Behaviors being trained in this application:

- Chimp to be sent away from the keeper for a specific task.
- Chimp to find a designated object.
- Chimp to bring the object to the keeper.



- Chimp to enter the transfer chute with the object.
- Chimp to drop the object into the hopper and give it up.

## Results

In further use of this activity, all items intentionally placed in the exhibit have been brought into the chute by one or another of the chimps and deposited in the hopper. Sometimes an object might be carried around for awhile to be investigated, played with and shown off to other chimps. But these too have eventually been brought in for the treat involved. Both verbal and food rewards are used. There are also the occasional items dropped into the exhibit by visitors.

By now, several months later, these occurrences have provided some *real-life test results* which suggest that the addition of a simple assemblage of PVC fittings as is described here can have a huge benefit. In the past, when the chimps found a can or bottle in the exhibit and made an attempt to trade it, they would bite and tear trying to make the object fit through the caging. There is potential here for mouth or hand injuries. Although somewhat limiting, the type of items most likely to find their way into the chimp exhibit will fit through the 4" (10.16cm) opening of the trade hopper.

At this time, five of the eight chimps will participate in this "activity" to one degree or another. As might be expected, the three non-participants are the eldest members of the group. However, of these, two will occasionally investigate the apparatus and reach into it. They apparently see no particular use for it themselves. Additionally, each of these will generally give up a found item after inspecting it, or toss it aside. That gives other individuals the opportunity to bring such an article to the keeper and receive the reward.

With additional experience, time, and some imagination, further applications would seem quite possible. This simple device provides some positive elements.

- The PRACTICAL application - retrieval of objects from the exhibit.
- And the ENRICHMENT provided by the training, the games, the challenges and the interactions between chimps and keepers.

## Acknowledgements

My thanks to staff photographer, Cathy Burkey for photos; fellow keepers, Bonnie Hendrickson and Sara Stevens for assistance in training and documentation; construction's Sulember Garza for caging modification; supervisors John Fried and Linda King, as well as Dallas Zoo management staff for document review and encouragement.

# Legislative Update

Compiled by Georgann Johnston  
Legislative Advisor  
Sacramento, CA



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## Land Added to National Wildlife Refuges in 5 States and New Habitat Created in Canada

The U.S. Migratory Bird Conservation Commission approved the acquisition of more than 4,660 acres of important migratory bird habitat in Idaho, Maine, Michigan, Texas and Utah for the National Wildlife Refuge System at its June 2003 meeting in Washington, D.C. The Cabinet-level commission approved Migratory Bird Conservation funds of more than \$4.5 million to acquire the land. All acquisitions had been previously approved by the affected states.

“Sportsmen and women have contributed a great deal to the development of the National Wildlife Refuge System,” said Interior Secretary Gale Norton. “Money raised by the sale of Federal Duck Stamps pays for these land acquisitions. Since the first Duck Stamp sale in 1934, about \$675 million has been raised to purchase more than five million acres of wetlands for the refuge system.”

New National Wildlife Refuge System acquisitions approved by the Conservation Commission are: Michigan: Acquisition of 153 acres of habitat for migratory waterfowl within the boundaries of Detroit River International Wildlife Refuge. Idaho: Acquisition of 760 acres of wetland habitat within the boundaries of Grays Lake NWR. Texas: Acquisition of 1,344 acres to provide habitat for migrating and wintering waterfowl within the boundaries of San Bernard NWR. Texas: Acquisition of 2,285 acres to preserve wetland habitat at Trinity River NWR. Utah: Acquisition of 105 acres to provide habitat for migratory waterfowl within the boundary of Bear River NWR. Maine: Acquisition of 18 acres to protect habitat for wintering waterfowl within the boundary of Moosehorn NWR.

The Commission also accepted recommendations from the North American Wetlands Conservation Council and approved the protection or restoration of more than 1.6 million acres of wetlands. A total of \$1.7 million was authorized under the North American Wetlands Conservation Act, which will be matched by nearly \$33 million in partner funds to restore habitat in Canada. *Source: USFWS Press Release 30 June 2003*

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## Cork Promoted to Save Iberian Lynx

Wildlife advocates and the governments of Spain and Portugal have begun to urge consumers to purchase wine and champagne bottled with real cork rather than synthetic stoppers in order to help prevent the Iberian lynx (*Lynx pardinus*) from becoming extinct. This species is indigenous only to Spanish and Portuguese forests from which cork is obtained. The use of synthetic stoppers in recent years has created a disincentive for protection and preservation of the lynx's natural habitat.

“Clever propaganda by the manufacturers of screw tops and plastic corks has led many people to think that cork stoppers are bad for the environment when exactly the opposite is true” said a spokesperson for World Wildlife Fund - United Kingdom. In 2002 the Iberian lynx became the first wild cat to be placed on the Red List of Threatened Species maintained by the World Conservation Union. It is believed that there are only about 150 members of the species, including fewer than 30 females capable of reproduction, currently alive. *Source: Animal NewsCenter, Reporting the News from the World of Animals 7 July 2003*

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## Endangered Dolphin Species Protected

The New Zealand Ministry of Fisheries recently banned commercial use of set nets to catch fish along the coast of North Island in order to help prevent the endangered Maui's dolphin



(*Cephalorhynchus hectori*) from becoming extinct. “All commercial set netting has been banned within four nautical miles of the coast,” said a Ministry spokesperson. “Amateur set netting was already banned in the zone.”

According to the International Union for Conservation of Nature and Natural Resources, there are only about 50 Maui’s dolphins currently alive. This species is the world’s rarest marine mammal. Members of this species were called North Island Hector’s dolphins until the end of 2002. The renaming was prompted by the discovery that the animals are genetically distinct from Hector’s dolphins. *Source: World Wildlife Fund Press Release 7 July 2003*

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### **Federal Legislation Pending in Congress**

A number of bills concerning animal issues are pending before the U.S. House of Representatives and/or the Senate. These bills include the following:

**Animal Fighting (HR 1532, S736):** To authorize felony-level jail time for federal animal fighting violations and ban the interstate and foreign transport of cockfighting weapons.

**Antibiotic Resistance:** To curb the overuse of antibiotics that support unnaturally overcrowded and unsanitary conditions on factory farms and endanger public health.

**Puppy Mills:** To crack down on chronic violators and improve humane standards for commercial breeders of dogs.

**Bear Bating (also called Don’t Feed the Bears Act - HR1472):** To prohibit the practice of setting out piles of rotting food and garbage on federal public land so hunters can shoot bears while they feed.

**Leghold Traps (HR1800):** To prohibit the interstate commerce of steel-jaw leghold traps or fur caught with these devices.

**Horsemeat (HR857):** To prohibit the slaughter, import, export, trade, and transport of horses for human consumption.

For more information on any of these pending pieces of legislation, visit and click on Government Affairs. *Source: Humane Activist March/April 2003*

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### **IWC Rejects Sanctuaries, Whaling Resumption; Approves Conservation Committee**

During a “bad-tempered third conference day,” delegates to the IWC annual meeting decisively rejected a bid by Japan to resume commercial whaling but also failed, despite strong support from over half of the IWC members, to provide the three-quarters majority needed to establish two new whale sanctuaries reports *SFGate.com, AP*. In rejecting Japan’s bid to resume commercial whaling, the U.S. sided with anti-whaling nations, who successfully argued that “too little is known about whale stocks,” and other threats such as accidental killing by fishing vessels, to allow Japan to kill 150 Bryde’s whales a year. *Source: GREENlines Issue#1891 6-23-03*

A sharply divided International Whaling Commission, by a 25 to 20 vote, approved the creation of a “conservation committee that could make recommendations about problems facing marine mammals” reports *Reuters News Service*. A group of 18 nations, including Australia, New Zealand, the United Kingdom and IWC host nation Germany have “banded together to sponsor an initiative that would strengthen the conservation agenda of the IWC. While environmentalists maintain that a more active conservation role is “essential to preserving endangered whales and dolphins,” whaling nations led by Japan and Norway are now “considering withdrawing from the IWC.” The conservation committee is slated to start work in 2004 on issues such as “cetaceans being trapped and drowned in fish nets, toxins in the oceans, climate change and the use of sonar.” *Source: GREENlines Issue #1888 6-18-03*

In a related whale news item, in what is described as “the first time that a world shipping lane has been altered to protect an endangered species, Canada has shifted shipping lanes in the Gulf of Fundy to avoid feeding grounds” where the world’s largest herd of endangered right whales spends the summer reports the *Boston Globe*. In the last decade “at least three right whales have been killed and scores badly injured by ships in the Bay of Fundy,” and marine biologists say that with only about 350 northern right whales left, “every animal is precious.” Source: *GREENlines Issue #1897 7-01-03*

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### **Control Program Blamed for Wolf Decline**

In a letter to Interior Secretary Gale Norton, a coalition of two dozen “conservation, religious, animal rights and community groups charged that the Interior Department’s ‘control program’ on Mexican wolves is ‘largely responsible’ for the decline in the wolf population over the past two years” reports the *Arizona Daily Sun*. The groups contend that the wolves need to “roam beyond a federally defined recovery area” in the Apache and Gila national forests if they are to establish new packs essential to recovery. The Center for Biological Diversity and other groups including the Sierra Club, Animal Protection of New Mexico and Christians Caring for Creation say that the policy of killing wolves that prey on livestock has reduced the population of reintroduced wolves from 27 in 2002 to 19 today. Source: *GREENlines Issue #1892 6-24-03*

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### **The Eagle Has Nested**

For the first time in over 70 years, bald eagles have successfully bred in Southern California reports the *San Jose Mercury News, AP*. In March, “two eaglets were discovered halfway up a tall pine tree” some 100 miles southeast of Los Angeles and last week “biologists saw the large, brown eaglets, about nine weeks old, taking short flights out of their nest near man-made Lake Hemet.” Wildlife officials are “hopeful that if the eaglets survive, the birds will have begun repopulating the southern end of their historical nesting range.” Source: *GREENlines Issue #1894 6-26-03*

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### **Virus Pushes India Vultures to the Brink**

In just a decade, India has lost over 95% of its vulture population, victim of a “mystery virus” that “threatens to push the gawky black birds to the brink of extinction” reports *Planet Ark, Reuters*. Once numbering in the tens of thousands, today there are “just a few thousand left,” and conservationists say “the dramatic drop in their numbers has enormous implications for the ecosystem across the globe.” Source: *GREENlines Issue #1869 5-21-03*

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### **Good Karma?**

The appearance of an endangered thick-billed parrot, whose last confirmed sighting in the U.S. occurred in the 1960s, at conservationist Ted Turner’s ranch in New Mexico has “turned into a frenzy” among bird watchers reports the *L.A. Times, AP*. The rare species is normally found in Mexico’s Sierra Madre Occidental mountain range and according to the ranch manager birders have flown in from all over, “It’s like observing an extinct species.” Source: *GREENlines Issue #1868 5-20-03*

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### **Key Deer Relocation Planned**

In an effort “to strengthen genetic diversity, while guarding against the animals total demise in case of a hurricane,” biologists are relocating excess endangered Key deer to expand a population on another island, Sugarloaf Key, in Florida’s Keys reports the *Miami Herald*. Since it was listed in 1967, the Key deer has become an ESA success story with numbers growing from about 50 to the 600 and 800 “that live mostly in and around big Pine Key and adjacent No Name Key. “By having deer populations on other islands, it’s kind of like the old saying, ‘Don’t put all your eggs in one basket’,” said a wildlife researcher. Source: *GREENlines Issue #1892 6-24-03*

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### **Scarlet Macaws in Trouble**

Macaws Without Borders, a conservation group dedicated to protecting the scarlet macaw, reports that “there could now be as few as 600 left in the wild” reports *Planet Ark, Reuters*. Conservationists warn that a “rare subspecies of scarlet macaw native to virgin jungle in southern Mexico, Guatemala, Belize and Honduras is being wiped out as settlers burn down its habitat to make room for crops,



poachers steal valuable chicks and authorities turn a blind eye.” According to environmentalists, marauding bands of armed “land grabbers” are “often sponsored by large landowners seeking to expand territory for rearing cattle.” *Source: GREENlines Issue #1901 7-08-03*

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### **Poaching Imperils Polar Bears**

The USFWS warns that polar bears which “traverse the floating ice between the Russian Arctic and Alaska are being shot in rising numbers” by Russian poachers and that “the killing could greatly diminish the bear population if it is not slowed” reports the *N.Y. Times*. The new report comes as the Senate considers ratification of a treaty between the U.S. and Russia “to protect the shared population of about 4,000 bears” by allowing only limited hunting by native populations and clamping down on poaching. Poaching is steadily on the rise with up to 400 bears a year killed, a level that could halve the population by 2020.

In a related story, scientific studies “suggest that extraordinary loads of contaminants have migrated to the Arctic and are weakening polar bears and other animals, jeopardizing their survival” reports the *L.A. Times*. The Arctic has become a “giant sink” collecting “many of the world’s most toxic chemicals, especially banned industrial compounds called PCBs and pesticides such as DDT” and as a result animals at the top of the food chain have become “among the most contaminated living organisms ever found, surpassed only by Pacific Northwest orcas, Baltic Sea seals and St. Lawrence River belugas.” *Source: GREENlines Issue# 1893 6-25-03*

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### **UK Cracks Down on Endangered Species Trade**

In a move described as “incredibly significant,” Britain, “a country widely regarded as being a hub in the global illicit trade,” has sharply increased penalties for trading in endangered species” reports *Planet Ark, Reuters*. Jail terms for illegal trading were increased from two to five years, “making the offence automatically arrestable,” and new rules were added making it against the law to trade in products derived from endangered species such as Shatoosh shawls and black rhino horn. According to the WWF, “globally hundreds of millions of plants and animals, worth billions of pounds were traded illegally each year, threatening the survival of many species such as tigers, snow leopards, bears and some plants,” and the changes will “have a lasting impact for endangered species all over the world.” *Source: GREENlines Issue #1890 6-20-03*

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### **USFWS Denies Puma in Boston Burbs, but Michigan May Be Another Story**

Despite numerous sightings, the USFWS continues to deny reports that a mountain lion “lives in a wooded area in Westford,” a Boston suburb reports the *Boston Globe*. Although the eastern puma is listed as endangered the Service contends that the species has been extirpated from the East Coast and Midwest. The chief of endangered species with the regional office of the USFWS maintains, “It’s like Bigfoot or Sasquatch, even the Abominable Snowman. Pick whatever myth you want. We killed them off.”

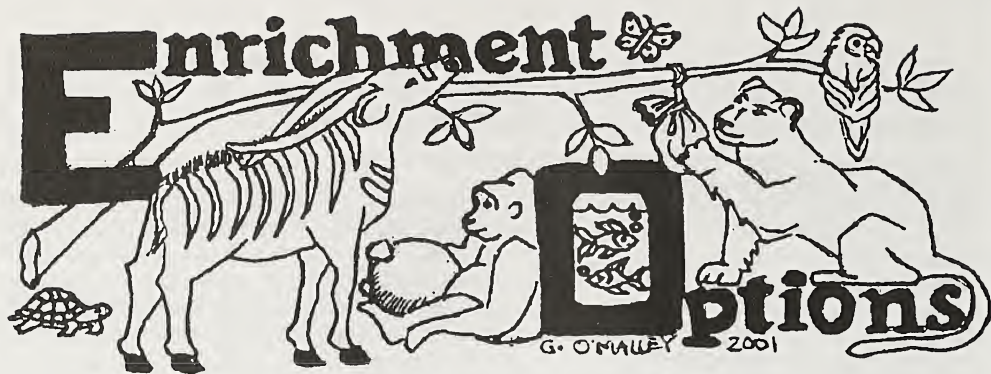
In a related story, some 20 calls to the Monroe County, Michigan sheriff’s office about “a large, tawny cat that weighed an estimated 120 pounds” have rekindled the controversy over the existence of eastern cougars in that state reports the *Detroit Free Press*. While the Dept. of Natural Resources “insists” that cougars were “wiped out in Michigan 100 years ago,” pictures of paw prints reveal “marks of the retracted claws,” uncommon in escaped or released pets. According to the Michigan Wildlife Conservancy, “it’s more likely one of the wild cougars that never were eliminated and might be expanding their range with the increased number of deer.” *Source: GREENlines Issue #1894 6-26-03*

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### **Invasives Primary Threat to U.S. Birds**

A new Audubon Society Report “Cooling the Hot Spots” maintains that “invasive species are the leading cause of bird extinctions, having entirely or partially caused the majority of all extinctions since 1800” reports the *Land Letter*. Over a third of the 200 species on Audubon’s WatchList of birds in danger or decline are primarily threatened by loss of habitat to invasive species. For example non-native Chinese tallow trees have transformed more than 55,000 acres of grassland habitat into woodlands at Texas, Aransas N.W.R. impacting millions of migratory birds and depriving the imperiled short-eared owl of wintering habitat essential to its survival. *Source: GREENlines Issue #1897 7-01-03*

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*EO Editors - Dawn Neptune, Utah's Hogle Zoo  
and Rachel Cantrell, Disney's Animal Kingdom*

## **Part II – Motivation, contrafreeloading and animal welfare: discussion points around diet presentation**

*By Dr. Joseph Barber, Research Fellow  
Disney's Animal Kingdom  
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Providing animals with a highly nutritious diet is of crucial importance to their welfare. However, ensuring their welfare requires more than just providing good nutrition. An animal's welfare represents a combination of its physical health and psychological well-being. Physical health is a fairly straightforward concept; it is represented by the absence of diseases or injuries. There is general agreement that a nutritious diet is an important part of ensuring that animals remain healthy (at least from a dietary standpoint). Psychological well-being is a much more complex concept. Psychological well-being addresses the subjective emotional responses of animals, and is based on understanding their motivational needs, providing them with the opportunity to perform species-appropriate behaviors, and to have some control and choice within their environment. Simply providing an animal its diet may address physical health, but may do nothing to address its psychological well-being. Since physical health and psychological well-being are both important to the animals' overall welfare, both need to be, and can be addressed when providing them with their diet. This article delves into some of the topics that are important to consider when thinking about how food is provided to the animals in our care. Some of this information can be discussed as part of the workshop presented in Part I of this two-part series (*Ed. Note: See Enrichment Options, July 2003, pg 288*).

### **Motivation**

Motivation is often a difficult concept to grasp because of its intangible nature. In essence, whenever an animal switches from one behavior to another, it is based on motivational changes occurring within that animal. An animal's internal physiological state (e.g., level of blood sugar) and the external environment (e.g., the presence of predators or a mate) both impact its behavior to differing degrees. Think of motivation as a 'black box' into which go the inputs (physiological states and environment factors) and out of which come behavioral responses. What happens within this 'black-box' affects which behavior an animal will perform. Thus, animals may react very differently to external stimuli or internal states depending on how this information is processed within this 'black box'. Exactly what happens within this 'black box' is unclear in many cases, but it is not necessary to understand the finer points of the many complex interactions that occur to begin to understand and address the motivational needs of animals.

Let us look at humans to provide an example of how the interaction between internal and external factors can affect our motivation to eat. After a large entrée in a restaurant, we are often faced with the decision of whether to have dessert. We often choose to have a dessert (e.g., we are motivated to



do so), not because we are hungry (the entrée satisfied our physiological need for food), but because as an external stimulus goes, a double chocolate fudge sundae sounds and looks very attractive. In this case, the external stimulus overrides our internal physiological state (e.g., satiation). Replace the double chocolate fudge sundae with plain dry sponge cake and our motivation to eat dessert vanishes. The external stimulus is no longer powerful enough to motivate us to eat. However, if we were still hungry after the entrée, then we might go ahead and have the sponge cake, especially if it was the only dessert available. Here our internal state (hunger) overrides the low quality of the environmental input (dry sponge cake). Finally imagine a very hungry person just about to tuck in to a large plate of food. Now imagine that a tiger suddenly appeared in the restaurant. The person's motivation to flee would then override their motivation to feed despite the fact that they were very hungry. Since we only have one set of limbs with which to perform our behavior, there can usually only be one motivational priority at a time (in this case fleeing is the priority).

Applying this knowledge to presentation styles of diet items can provide us with useful insights to how animals will react to the various diet presentations styles that are used. For example, the location of a feed station/puzzle feeder may affect how the animal uses that feeder. The fear of being out in the open for some species may inhibit their motivation to feed at a feeder that is in plain view of other animals or people. Providing some shelter around the feeder may disinhibit the animal's feeding response by reducing the fear response. In this case, when not feeling fearful, feeding becomes the greater motivational priority. Providing animals with the opportunity to perform species-appropriate behaviors (e.g., foraging) will only be successful if they express the appropriate motivation to take advantage of that opportunity.

In many cases, animals have stronger motivations to perform certain behaviors than others. That is, some behaviors are more important for the majority of the time. Feeding behavior is important for most species, since not feeding would result in eventual death. Much of the research on the importance of feeding has come from preference tests and behavioral demand studies (see Dawkins 1990, 1998 for a review). What these tests generally reveal is that under experimental conditions, many animals will work harder for a fixed amount of food (for example by pressing a bar in a Skinner box 100 times rather than 10 times) than they will for the opportunity to perform certain other behaviours that also require more work to be able to perform. When it is costly to perform behaviors, only the most important behaviors will be performed. Feeding is important; it is certainly easy enough to provide animals with the opportunity to feed (all zoos and aquariums do this), and this will certainly address their motivational needs..., or will it?

Meeting the motivational needs of animals can be more complex than it at first appears, especially when animals are not only motivated by the end-points of any behavior (e.g., the actual ingestion of food – not being hungry any more), but also by the performance of the behavior itself. Many behavioral sequences are made up of two distinct phases: the appetitive phase, and the consummatory phase (McFarland, 1987). Although the words appetitive and consummatory are associated with food, they also apply to other sequences of behavior. For example, *searching* for a mate is the appetitive phase of mating, while actually *copulating* is the consummatory phase. In general, the appetitive phase involves behavioral elements that begin a particular sequence of behaviors, while the consummatory phase usually ends a behavioral sequence.

Consider an animal in the wild, when this animal begins to feel hungry, it is often not in a position to eat immediately. The first (or appetitive) part of feeding behavior involves looking for food. For an insectivore this may involve foraging through leaf litter, for a carnivore this may involve stalking prey. Animals have evolved to perform these behaviors, since not doing so in the wild could mean that these animals would die of starvation. There is often no such thing as a free lunch in the wild. In many cases, the appetitive phase of feeding takes up much more of an animal's day than the consummatory phase. There are two important considerations that come from this, both of which are discussed by Shepherdson *et al.* (1993). Firstly, priority needs to be given to ensure that animals can fully express their appetitive elements of feeding behavior as well as still providing the opportunity for consummatory behavior. The second is that many animals often prefer to work for their food (forage and hunt, in this case) in preference to receiving free food. This phenomenon has been labeled 'contrafreeloading' by Inglis *et al.* (1997).

### Contrafreeloading

The term 'contrafreeloading' represents the observation that animals under experimental conditions will make a response (usually a learned operant response) to obtain a reward even in conditions when the reward substance is available for free (Robertson & Anderson 1975). The idea that (certain) animals may prefer to work for food rather than accept free food may seem strange, but perhaps not when you consider the advantage that this gives animals in the wild. Unlike many captive environments, the wild is an ever-changing environment; the complex interplay between members of the same species, members of different species, and other environmental factors (such as weather), mean that the resources available to animals will vary day-to-day and from place-to-place. Working for food when free food is available can be seen not as a waste of energy or efficiency, but as an investment into gathering information about the environment (Inglis *et al.* 1997). This is not to say that all animals will prefer to work for food all of the time. Only certain species have been shown experimentally to show contrafreeloading (see Inglis *et al.* 1997), and even within those species, very hungry animals will certainly choose free food (Inglis & Fergusson, 1986). As their hunger decreases, however, their motivation to investigate the environment increases. While animals may not 'prefer' to work for food under all situations, most are certainly adapted to be able to do so.

An animal in the wild has control over certain aspects of its life – when it eats, sleeps, drinks, etc. It must rely on its knowledge of the environment to ensure that it can obtain all of its resources. Although a pile of free food provides for an animal's needs in the short-term, there is no saying how long that free food will last, or whether there will be free food in the future. An animal that does not know where its next meal is coming from may risk starvation. An animal that invests time and energy into gaining knowledge about its environment may be able to take less advantage of the free food, but will likely know where to look for more food in the environment when any free food is gone. It is not the case that animals understand or know that free food may not last forever, or that they risk starvation if they do not explore the environment. However, those animals that show exploratory behavior may have an adaptive advantage during times of food shortage. In other words, they behave 'as if' they know. Whether or not a species needs to know a lot about its environment will often depend on its natural history, and especially the type of food that it eats. These factors will need to be taken into account in the development of food presentation strategies.

What does working for food look like in captive situations? Many species of primates will forage through material such as wood shavings, straw, hay, or their conspecifics hair looking for food. Much of this time is spent searching, and relatively little is spent actually eating. An animal that repeatedly turns over straw looking for grains of rice is 'working' for its food. In fact, the importance of food means that some animals under certain circumstances will continue to work (e.g., turn over straw) even if the cost for doing so (e.g., the number of times they have to turn over the straw until they find a food item) is quite high. Certain animals will use their natural behaviors to forage/hunt for food even if they are provided with free food (e.g., rhesus macaques; Reinhardt 1994), because that is what they have evolved to do. Evolutionary important behaviors are important from an animal welfare perspective. Those animals that are unable to perform highly motivated, species-appropriate behaviours may become frustrated, and such frustration can lead to the development of abnormal or aggressive behavior (Duncan & Wood-Gush, 1972).

This discussion about motivation, appetitive behaviors and contrafreeloading is linked to the development of the workshop of diet presentation because there are important scientific concepts underlying different food presentation styles. It is important to think about the way that food is provided to animals not only from a nutrition standpoint, but from a behavioral one, too. Providing animals with the opportunity to perform their species-appropriate appetitive behaviors, and providing them with control over their environment by allowing them to work for food (or work to gain information about their environment), is crucially important. Shepherdson *et al.* (1993) conclude, "An environment in which an animal can find food as a consequence of its natural exploration and foraging behavior, is an essential key to approximating natural habitats and to improving animal welfare".



## Acknowledgements

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*(Ideas appearing in this column have not necessarily been tested by the editors for safety considerations. Always think ahead and use good judgement when trying new ideas. You are invited to submit materials for the Enrichment Options Column. This might include recipes, toys, puzzle feeders, olfactory enrichment ideas, etc. Drawings and photos of enrichment are encouraged. Send to: AKF/Enrichment, 3601 S.W. 29th St., Suite 133, Topeka, KS 66614-2054. Eds.)*

## MOVING?

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THANKS FOR YOUR HELP!

# Toledo Zoo Welcomes Baby Elephant

At 11:49 p.m. on 30 April, 2003, the Toledo Zoo staff welcomed the arrival of a 275-pound male African elephant calf. The youngster, as yet unnamed, was born to 24-year-old Renee following a successful non-surgical artificial insemination procedure performed in August of 2001. The Toledo Zoo is only one of a handful of zoos that have ever tried AI in this species. Prior to Renee's AI procedure, the zoo's other female, 21-year-old Rafiki, in October of 2000 became the first of her species in the world to successfully conceive by a surgical AI procedure. In July of 2003, Rafiki gave birth to a 350-pound stillborn calf. The birth had been progressing well until, in the last frantic moments, the calf suffocated in the birth canal.

Renee's offspring appears to have beaten the odds on several fronts. Breeding success for African elephants in captivity has been low in North American facilities with only three calves surviving in the past 15 years (one in Tennessee, born in April; and two in Indianapolis, born in 2000). The youngster has made it through the first difficult months, appears to have bonded well with its mother and is making good developmental progress. Approximately 50% of captive-born African elephants do not survive long enough to reach age one due to weakness, disease, or maternal neglect or attack. The calf was initially separated from its first-time mother so that there would not be a chance of injury. Staff gradually introduced the two elephants, and when Renee and her calf were allowed in the same pen, the youngster immediately began nursing. Before the calf began nursing, zoo staff milked Renee and hand-fed the baby. Now that the calf is successfully nursing, it will still receive nightly hand-feedings of a mixture of Renee's milk and formula.

Renee and her baby made their public debut on 28 May. They will go on exhibit during regular zoo hours as long as neither Renee or the young male show signs of stress. The zoo staff continues to monitor the two closely for any signs of trouble so that immediate intervention can be provided if necessary.



**Male African elephant calf born at The Toledo Zoo on 30 April 2003.** (Photo by Andi Norman)

However, the journey to this point has been a long and stressful one for all those involved. To prepare for the AI procedure, the Toledo Zoo elephant staff worked with Renee to insure the procedure could be performed safely and effectively. Extensive effort to prepare for and complete the procedure was not only required from the Toledo staff, but also from many other people and organizations. Semen



was collected at two other institutions (Lion Country Safari and Disney's Animal Kingdom) and transported to Toledo the same day as the AI procedure. The Toledo Zoo once again partnered with Dr. Dennis Schmitt, professor at Southwest Missouri State University and Elephant Reproductive Specialist, who performed the procedure on both Renee and Rafiki. Dr. Schmitt currently heads one of only two teams in the world successful in performing elephant insemination.



**Toledo Zoo's baby African elephant gets "up close and personal" with the camera. (Photo by Sue McMahon)**

The population growth of elephants is very slow even under the best conditions because they are not sexually mature until about 10 years of age, ovulation occurs

only about every four months, and gestation is nearly two years (22 months). In an attempt at natural impregnation, both Renee and Rafiki had been sent in December of 1998 to the Pittsburgh Zoo in hopes that they would become pregnant by that facility's African bull, Jack, a proven breeder. However, after a year's stay with no success, the Toledo Zoo opted for the AI procedures on both of their females.

Both Renee and Rafiki were wild-born in Zimbabwe and came to the Toledo Zoo in 1982 and 1986 respectively. Renee weighs approximately 8,300 lbs. while Rafiki tips the scales at 8,800 lbs.

At the time of this writing, the Toledo Zoo was conducting a "Name the Baby Elephant" contest with the name to be announced August 1st. You can catch up with the baby's progress at their website at [www.toledozoo.org](http://www.toledozoo.org) by clicking on the elephant icon located on the bottom right-hand corner of the home page.

#### **Newborn Baby Elephant stats (He's grown a bit since these were taken!):**

- **Weight at birth:** 275 lbs.
- **Height at shoulder:** 34 1/2 inches
- **Trunk length:** 14 1/2 inches
- **Length from tip of tail to tip of trunk:** 36 1/2 inches
- **Tail:** 17 inches
- **At highest point of back:** 37 1/3 inches
- **Tip width of trunk:** 2 inches

*(Compiled from Toledo Zoo press releases and articles published in The Toledo Blade. Photos provided by Andi Norman, Public Relations Manager, The Toledo Zoo, Toledo, OH)*



# Book Review

## **Tarantulas of Belize**

By Steven B. Reichling 2003

Krieger Publishing Company, Krieger Dr., Malabar, Florida, 32950

ISBN#1-57524-228-1

130 pgs. Hardcover, 15 color photos, 51 black & white photos

Price: \$21.95

*Review by Diane Barber  
Curator of Ectotherms  
Fort Worth Zoo, Fort Worth, TX*

This book is particularly noteworthy because it is rare to find publications for tarantula fauna dedicated to a single region. This is probably the first of many field guidebooks for specific invertebrate taxa to come and is a fine example from which future authors and researchers can build.

The *Tarantulas of Belize* is written in narrative form, making it insightful and enjoyable to read. Reichling composed this field guide as a resource to be used for professional and amateur biologists, as well as anyone with an interest in tropical wildlife. The information presented is practical and detailed. Although the subject matter is Belizean species, the general information given on tarantula biology, behavior and habitat usage can undoubtedly be applied to other species research, captive husbandry and conservation efforts.

Informative details covered within the text are written in a way that tells a story and evokes a sense of stewardship for tarantulas. The first few chapters cover the physiography and history of Belize, spider classification, types of tarantula habitats and the importance of tarantulas and their conservation status. Personal observations of tarantulas in Belize by Reichling provide insight to nocturnal behaviors, burrow activities, reproduction events, feeding strategies, predators and defenses and juvenile behaviors, some of which have rarely been documented.

Also included are useful collecting techniques, information on regulations and acquiring permits, as well as packing methods for shipping tarantulas. Like any proper field guide, this book includes details on how to identify different species, what their diagnostic characters are and includes an easy key that doesn't require the use of a microscope! Each species account consists of a photograph, description, similar species listing, distribution and habitat (including map), abundance, reproductive biology and remarks.

Whether planning a trip to Belize, constructing a research project, or if person just possesses a keen interest in tarantulas, this book is certainly an excellent resource to have in hand.

## **Tarantulas in the Vivarium**

By Peter Klaas. Technical editing of the English Translation by Paul Gritis. 2001

Krieger Publishing Company, Krieger Dr., Malabar, Florida, 32950

ISBN#1-57524-018-1

130 pgs. Hardcover, 123 color photos \$32.50

*Review by Diane Barber, Curator of Ectotherms  
Fort Worth Zoo, Fort Worth, TX*

Anyone that has kept tarantulas knows that good reference material on their captive husbandry is relatively scarce. *Tarantulas in the Vivarium* is certainly a basic resource any keeper working with eight-legged creatures should possess.



A German hobbyist, Peter Klaus, who has had extensive experience caring for and breeding a variety of tarantula species, originally wrote this book in 1989. This recent edition, translated into English in 2001, includes updated taxonomic and common names. Although this book was originally written more than 10 years ago, its contents remain current and will prove useful.

This book is divided into three main sections. The first section provides the reader with a good overview of the distribution of tarantulas and their natural history. Topics covered include an evolutionary tree, descriptive reviews of external anatomy and general ecology information, which contains detailed observations and photographs of molting stages, reproduction events and egg development.

The second part of the book is dedicated to husbandry and captive breeding. Information is provided about disease and parasites routinely found in captive specimens, common injuries and how to prevent them, correct handling techniques and proper packing instructions for shipment. Other topics, such as how to obtain and select proper specimens and how to build a small tarantula vivarium, are included. Keepers will find techniques used for breeding introductions within this section particularly helpful.

The last and perhaps most beneficial part of the book includes detailed accounts for 32 genera of frequently kept tarantulas in captivity. These accounts include specific information on 33 American, seven African and 10 Asiatic species. Each account includes color photographs, scientific and common names, distribution, maximum size, description and remarks. Captive husbandry information is also given for each species and lists cage size recommendations, suggested substrate and caging "props," temperature and humidity requirements, as well as behavior and breeding accounts.

In conclusion, *Tarantulas in the Vivarium* is a good resource for any spider enthusiast and is certainly worth the minor investment.

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### Three Types of Data Transfer Forms Available from AAZK

Just a reminder that three different types of data transfer forms are available to requesting institutions from AAZK at no charge. These forms are designed to be used whenever an animal is shipped from one facility to another so that important information on that animal can be passed on to the receiving keeper and veterinary staffs.

The following forms are available by contacting Barbara Manspeaker at 1-800-242-4519 (U.S.) and 1-800-468-1966 (Canada), or by emailing your request to [aazkoffice@zk.kscoxmail.com](mailto:aazkoffice@zk.kscoxmail.com)

- Animal Data Transfer Form (ADTForm) - includes information on diet, reproductive history, general medical history/physical conditions, and enclosure/maintenance data on animal(s) being shipped.
- Enrichment Data Transfer Form (EDTForm) - includes information on behavioral history, enrichment currently used and how implemented (food, exhibit, artificial, etc.), safety concerns for animal(s) being shipped.
- Operant Conditioning Data Transfer Form (OCDTForm) - includes general background information, training specifications, training schedule, behaviors trained and methods used for animal(s) being shipped.

These forms are provided free of charge as a professional courtesy of AAZK, Inc. We encourage all zoos, aquaria and other animal care facilities to adopt the use of these forms when shipping animals. We extend our thanks to the following institutions for assisting in the printing expenses for these forms: Columbus Zoo (ADTForm), Arizona-Sonora Desert Museum (EDTForm), and Disney's Animal Kingdom (OCDTForm).

*Institutions wishing to advertise employment opportunities are asked to send pertinent data by the 10th of each month to: Opportunity Knocks/AKF, 3601 SW 29th St., Suite 133, Topeka, KS 66614-2054. Please include closing date for positions available, and when setting these dates keep in mind that because of bulk-mail, most readers do not receive their AKF until the middle of the month or later. There is no charge for this service and fax or e-mail listings of positions which become available close to deadline are accepted. Our Fax is (785) 273-1980; e-mail: [akfeditor@zkk.scoxmail.com](mailto:akfeditor@zkk.scoxmail.com)< Listing may be sent as MS Word attachment. We are no longer located at the Topeka Zoo, so please note new address to avoid delays in processing.*

**Keepers/Vet. Technicians** - The Hattiesburg Zoo, Hattiesburg, MS

For more information regarding this position please contact John Wright, General Curator, Hattiesburg Zoo, Hattiesburg, MS 39401, (601) 545-4576, email: [jwright@hattiesburgms.com](mailto:jwright@hattiesburgms.com)< This is a full-time position with state benefits, salary commensurate with experience and qualifications **Responsibilities:** The Hattiesburg Zoo is currently updating its Animal Care candidate pool. We seek career driven, creative, team-oriented individuals. Future openings, will be responsible for, but not limited to the following; daily husbandry, exhibit cleaning and maintenance, diet preparation and feeding, documentation, conditioning and training of collection, educational programs, and veterinarian assistance. **Requirements:** Job requires minimum high school graduate (college degree preferred), one (1) year experience at an AZA institution (paid or volunteer), experience with a diverse collection.

**Curator of Live Collections** - Muskoka Wildlife Centre, Severn Bridge, Ontario, Canada

Please send resumé and references to the Muskoka Wildlife Centre via fax: (705) 689-0223 or email: [employment@muskokawildlifecentre.com](mailto:employment@muskokawildlifecentre.com) or mail: Box #89, Severn Bridge, Ontario, Canada.

Hiring immediately, but will wait for the right person.

**Requirements:** Wildlife education centre featuring the province's largest collection of wildlife species native to Ontario is looking for a curator of live collections. Must have experience in animal husbandry, enclosure design, construction and maintenance as well as managing a small keeping staff. Knowledge of North American wildlife species ecology and captive management is a benefit. Year-round employment in Ontario's prime cottage country. Wage will be based on experience

**Chimp Keepers** - Goin' Ape/People and Chimps Together - Auburn, CA,

Located 30 minutes Northeast of Sacramento, CA.

Please fax resumé and contact information to (530) 823-1874. Include three (3) work references with phone numbers. Please Do Not call. Please wait for us to respond to your fax.

We have an opening for two (2) part-time great ape/chimpanzee keepers. Looking for dedicated keepers to work with 16 chimpanzees and 1 orangutan ages 4-32. This group of chimpanzees have been together for 30 years. Wage is \$8-10/hr depending on experience. Health insurance after 90 day probation period and if moved to full-time. See our website at [www.chimppact.org](http://www.chimppact.org)<

**Zoo Keeper/Grasslands** - Audubon Zoo, New Orleans, LA

Send resumé to: Director of Human Resources, Mike Burnett, 6500 Magazine St., New Orleans, LA 70118 or email to: [mburnett@auduboninstitute.org](mailto:mburnett@auduboninstitute.org)<

**Requirements:** Good written/oral communication skills and the ability to work effectively in a team-oriented environment. Associate's degree in biology or related field and one (1) year experience preferred or equivalent combination of training/experience in the care of mammals, preferably hoofstock, carnivores and primates. All candidates must have the ability to lift 80 lbs. and a willingness to work outdoors. A willingness to work weekends, holidays, and/or overtime is also required.

**General Working Supervisor - Mammal, Reptile & Bird Depts.** - Out of Africa Wildlife Park, AZ

Please mail or fax resumé to Dean Harrison, Out of Africa Wildlife Park, 9736 No. Ft. McDowell Rd, Scottsdale, AZ 85264. Phone (480) 837-6683, Fax (480) 837-7379. Visit our website at [www.outofafricapark.com](http://www.outofafricapark.com)< **Position open until filled.**

**Requirements:** Must have degree, four (4) years management, good people and communication skills. Experienced caregiving for many types of species, able to speak publicly to large audiences, while interacting with animals in a full contact setting is necessary. Lifting up to 100 lbs may be required. Weekend and holiday work is necessary, according to shift. Salary depends on experience. Full benefits.

**Elephant Handler** - Natural Bridge Zoo, VA

Send resumé to: Natural Bridge Zoo, P.O. Box 88, Natural Bridge, VA 24578 or Fax (540) 291-1891 or phone (540) 291-2420 or email [NaturalBridgeZoo@hotmail.com](mailto:NaturalBridgeZoo@hotmail.com)<

**Responsibilities:** The care and husbandry of two female African elephants (19 years old) in free contact. **Requirements:** Minimum of three (3) years experience working with elephants. Must be able to do rides, demonstrations and give talks to the public. Looking for an eager, energetic, friendly, self-motivating person. Housing available.



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Mail this application to: AAZK Administrative Offices, 3601 S.W. 29th, Suite 133 Topeka, KS 66614-2054. Make checks/money orders payable to AAZK, Inc. Must be in U. S. FUNDS ONLY. Membership includes a subscription to *Animal Keepers' Forum*. The membership card is good for free admission to many zoos and aquariums in the U.S. and Canada.



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# ANIMAL KEEPERS' FORUM



The Journal of the American  
Association of Zoo Keepers, Inc.

**SEPTEMBER 2003**

**Managing Editor:** Susan D. Chan • **Associate Editors:** Gretchen Ziegler, Sequoia Park Zoo & Kayla Grams, Lovell, WY • **Enrichment Options Coordinators:** Dawn Neptune, Utah's Hogle Zoo & Rachel Cantrell, Disney's Animal Kingdom • **Legislative Outlook Column Coordinator:** Georgann B. Johnston, Sacramento, CA. • **ABC's Column Coordinator:** Diana Guerrero, Big Bear Lake, CA • **Reactions Column Coordinator:** William K. Baker, Jr., Little Rock Zoo • **The Water Column Coordinators:** Dan Conklin and Kevin Shelton, The Florida Aquarium and Bruce Elkins, Indianapolis Zoo

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**AAZK Executive Director:** Ed Hansen, AAZK, Inc., Topeka KS  
also serves as AAZK Liaison to the American Zoo & Aquarium Association (AZA)

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### **AAZK PUBLICATIONS - CONTINUING DATA COLLECTION**

Biological Information (formerly Biological Values), 4th Edition - Jan Reed-Smith, Columbus Zoo

AAZK Enrichment Notebook - Lee Houts, Folsom City Zoo





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## About the Cover.....

This month's cover features a *Rhinoceros Iguana* (*Cyclura cornuta cornuta*) drawn by Dan Alldredge, a Keeper at the Mesker Park Zoo & Botanical Gardens in Evansville, IN. *Rhinoceros iguanas* are rather bulkily-built lizards. Adults range from 2-4 ft. (6-1.2m) in length with males weighing between 13-22 lbs. (6-10kg). Color is usually mid- to dark shades of gray, charcoal or slate and sometimes with hints of darker cross banding. Males are larger with bulkier heads and more pronounced tri-nose horns (which give this lizard its name). Mating occurs around April with 5-16 eggs being laid June through August. They are found in Hispaniola (Haiti and Dominican Republic, including most of the offshore islands) where they, like most island wildlife, suffer from habitat loss from humans, feral dogs, pigs & mongoose. Habitat is scrub woodlands, dry thorny bush, thicket & cactus. Lifespan is approximately 20 years. Their diet consists of leaves, flowers, fruit, some insects and small animals. A captive diet may include kale, collard greens, alfalfa, endive, fruit mix, hard-boiled eggs, banana and crickets. Thanks, Dan!

*Animal Keepers' Forum* publishes original papers and news items of interest to the animal keeping profession. Non-members are welcome to submit articles for consideration. Articles should be typed or hand-printed and double-spaced. Authors are encouraged to submit their manuscripts on a disk as well as in hard copy form. Manuscripts submitted either on disk or electronically as attachments to an email should be submitted in Microsoft WORD. All illustrations, graphs, charts and tables should be clearly marked, in final form and should fit in a page size **no greater than 5.5" x 8.5"** (14cm x 22cm). Literature used should be cited in the text (Brown, 1986) and alphabetically in the final bibliography. Avoid footnotes. Include scientific name (as per ISIS) the first time an animal name is used. Thereafter use common name. Use metric system for weights and measurements (standard equivalents may be noted in parenthesis). Use the continental dating system (day-month-year). Times should be listed as per the 24-hour clock (0800, 1630 hrs. etc.). Glossy black and white or color prints (minimum size 3" x 5" [8cm x 14cm] ) are accepted. Clearly marked captions should accompany photos. Please list photo credit on back of photo. Photographs may be submitted electronically as either JPEG or TIFF file attachments.

Articles sent to *Animal Keepers' Forum* will be reviewed by the editorial staff for publication. Articles of a research or technical nature will be submitted to one or more of the zoo professionals who serve as referees for *AKF*. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Lengthy articles may be separated into monthly installments at the discretion of the editor. The editor reserves the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed, appropriately-sized envelope. Telephone, fax or email contributions of late-breaking news or last-minute insertions are accepted as space allows. Phone 1-800-242-4519 (US); 1-800-468-1966 (Canada); FAX (785) 273-1980; email is [akfeditor@zk.kscoxmail.com](mailto:akfeditor@zk.kscoxmail.com)

**Deadline for each regular issue is the 10th of the preceding month.  
Dedicated issues may have separate deadline dates and will be noted by the editor.**

Articles printed do not necessarily reflect the opinions of the *AKF* staff or the American Association of Zoo Keepers, Inc. Publication does not indicate endorsement by the Association.

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E-Mail Addresses: You may reach Barbara Manspeaker at AAZK Administrative Offices at: [aazkoffice@zk.kscoxmail.com](mailto:aazkoffice@zk.kscoxmail.com)< You may reach Susan Chan and *Animal Keepers' Forum* at: [akfeditor@zk.kscoxmail.com](mailto:akfeditor@zk.kscoxmail.com)<

**AAZK Website Address: [www.aazk.org](http://www.aazk.org)**

**BFR Website: <http://bfr.aazk.org>**



# ***Scoops & Scuttlebutt***



## **Attention AAZK Conference Delegates**

Once again, the AAZK Enrichment Committee and AAZK Animal Behavior Management Committee will jointly host an informal video session during the AAZK National Conference in Cleveland. We invite delegates to bring video tapes of enrichment efforts or training sessions to share with their colleagues. Tapes should be no longer than 10 minute segments to ensure there is opportunity for all participants to share their experiences. "A picture is worth a thousand words" and nothing conveys an idea like a moving picture. So, shoot some tape of your successes to share at the AAZK National Conference in Cleveland.

## **Research/Conservation Workshop Planned for Cleveland Conference**

The AAZK Keepers in Research, and, Conservation, Restoration, and Preservation Grant Committees are sponsoring a Research and Conservation Workshop during the 2003 National Conference in Cleveland - Come and join us!

The workshop will cover a few of the many interesting and valuable projects members have initiated or participated in. We also will discuss some of the things you need to do to get involved in research or conservation; how to start your own project, and how the grant committees can better serve the AAZK membership.

AAZK offers three different \$1,000.00 grants each year. Come and join us and find out how you can benefit from this program. If you have been thinking of a research project bring the idea and we will help you, or just come and join the discussion on how AAZK can help you better know and research your animals. For questions or additional information contact: jan reed-smith at [jsmith@colszoo.org](mailto:jsmith@colszoo.org) or [jsotter@iserv.net](mailto:jsotter@iserv.net)<

## **SOS Rhino Announces Borneo Rhino Challenge 2004**

SOS Rhino, a non-profit foundation dedicated to protecting rhinos with a focus on the critically endangered Sumatran rhino (*Dicerorhinus sumatrensis*), announces the *Borneo Rhino Challenge 2004*, a biathlon consisting of a mountain trek and biking in Malaysian Borneo. This 12-day event to be held in May 2004, will raise funds for SOS Rhino's conservation efforts to support anti-poaching patrols in Borneo.

The event consists of a two-day, 85-mile mountain biking challenge coupled with a hike to the summit of Mt. Kinabalu, elevation 13,422 feet, as part of the two-week adventure. Also, as part of the Challenge, the team will join SOS Rhino's field staff deep in the jungles of Tabin Wildlife Reserve, in search of signs of the elusive Sumatran rhino. One of the highlights of the trip is a visit to the Sepilok Orangutan Sanctuary and rhino-breeding center in Sandakan, Malaysia.

The program is open to 20 adventurous people who must be fit, healthy and ready to work hard. The estimated cost is \$4,000 per person including airfare. There will be guides, rangers and medical and mechanical support close by at all times. SOS Rhino is partnering with Save the Rhino International for the event. More information may be found on their website at [www.sosrhino.org](http://www.sosrhino.org)<

## **AAZK Website Has New Look - Check It Out!**

For those of you who haven't visited the AAZK, Inc. website recently you may want to stop by. It has a brand new look and new navigation which should make it easier to find your way around the site. There are also two new sections which have been added: the Animal Behavior Management Committee and Enrichment Committee both have informational sections on the new site. This is the first phase of the restructuring with more to come down the road. Any suggestions and/or comments are welcome. Again make sure you stop by to see the new and improved site at <http://www.aazk.org>.

# Coming Events

**American Zoo and Aquarium Association (AZA) Annual Conference** - 7 - 11 September 2003 in Columbus, OH. Hosted by Columbus Zoo and Aquarium. For more information contact Patty Peters: e-mail [ppeters@colszoo.org](mailto:ppeters@colszoo.org)

**2003 AZAD Annual Conference** - 9-14 September 2003. Hosted by Omaha's Henry Doorly Zoo, Omaha, NE. Interested parties may contact Judy Sorensen at 10969 North Lakeshore Dr., Blair, NE 68008 or by email at [howard@nfinity.com](mailto:howard@nfinity.com)

**2003 Association of Zoological Horticulture** - 13-18 September 2003. Hosted by Toledo Zoo. For more information contact Alan Donges at (419) 385-5721 ext. 2149 or email [greenhouse@toledozoo.org](mailto:greenhouse@toledozoo.org)

**2003 Red Panda SSP Keeper Training Workshop** 19-21 September 2003 at the Knoxville Zoological Gardens, Knoxville, TN. For more information contact Crystal Anderson at (865) 637-5331 ext. 389 or email [canderson@knoxville-zoo.org](mailto:canderson@knoxville-zoo.org)

**The Aquarium and Zoo Facilities Association** - 21-24 September 2003, hosted by the Philadelphia Zoo. For info visit [www.azfa.org](http://www.azfa.org) or contact Matt Suydam at (215) 243-5355 or fax (215) 243-5391.

**30th National AAZK Conference** - 26-30 September, 2003. Hosted by the Greater Cleveland AAZK Chapter and Cleveland Metroparks Zoo. Watch for further information in upcoming issues of *AKF*. Registration and Hotel Forms may be found in April issue and appeared again in the July *AKF*.

**Zoological Registrars Association (ZRA) 2003 Conference** - 2-4 October 2003, hosted by the Brookfield Zoo. For info visit [www.zra.homestead.com](http://www.zra.homestead.com) or contact Debbie Johnson (708) 485-0263 ext. 460; email [dejohnso@brookfieldzoo.org](mailto:dejohnso@brookfieldzoo.org) or contact Pam Krentz at [pak@clevelandmetroparks.com](mailto:pak@clevelandmetroparks.com)

**Elephant Managers Association Conference** - October 2-5, 2003 - Hosted by Knoxville Zoological Gardens, Knoxville, TN. For more information, call (865)-637-5331, ext. 359 or e-mail [bhargis@knoxville-zoo.org](mailto:bhargis@knoxville-zoo.org)

**First International Conference on Zookeeping in 2003** - The Netherlands - Will be held between 2-10 October at Birdpark Avifauna. For further information please visit: [www.iczoo.org](http://www.iczoo.org)

**American Association of Zoo Veterinarians** - 5-9 October, 2003 in Minneapolis, MN. For additional information, visit the AAZV website at [www.aazv.org](http://www.aazv.org) or contact Wilbur Amand, VMD,

Executive Director/AAZV, 6 North Pennell Rd., Media, PA 19063; Phone (610) 892-4812; Fax (610) 892-4813; email [AAZV@aol.com](mailto:AAZV@aol.com)

**The 2003 ChimpanZoo Conference** - 25-29 October, 2003 in Boca Raton, FL. The focus of the meeting will be "Long Term Care for Captive Nonhuman Primates". Additional information is available on the ChimpanZoo website at [www.chimpanzoo.org](http://www.chimpanzoo.org) or by e-mail at [info@chimpanzoo.org](mailto:info@chimpanzoo.org) or by phone at (520) 621-4785.

**The Sixth International Conference on Environmental Enrichment** - 2-7 November 2003 in Johannesburg Zoo, South Africa. Sixth International Conference on Environmental Enrichment in Johannesburg Zoo, South Africa. Hosted by the Johannesburg Zoo. For more information on the conference, including fees, registration facilities, reduced flights and pre- and post-conference tours, please go to [www.jhbzoo.org.za](http://www.jhbzoo.org.za) or contact Mathew van Lierop at [mathew@jhbzoo.org.za](mailto:mathew@jhbzoo.org.za) or on +83 600 2677.

**ACVP/ASVCP 2003 Concurrent Annual Meeting** - American College of Veterinary Pathologists and American Society of Veterinary Clinical Pathology joint meeting - 15-19 November, 2003 in Banff, Alberta, Canada. For more info contact ACVP at: Phone - (608) 833-8725 ext. 145; Fax - (608) 831-5485; email - [meetings@acvp.org](mailto:meetings@acvp.org); web - [www.acvp.org/meeting/](http://www.acvp.org/meeting/)

**International Polar Bear Husbandry Conference** 4-7 February 2004 in San Diego, CA. Polar Bear International (PBI) in association with the AZA's Bear TAG are cohosting this conference to be held at the Bahia Hotel on Mission Bay. They are bringing together many of the most experienced and knowledgeable "bear" professionals in the world, including noted scientists, zookeepers, and naturalists representing a broad spectrum of institutions. Information and online registration is now available on PBI's website (<http://www.polarbearsinternational.org>). This includes the invited speaker list (updated monthly) as well as the conference agenda, goals, scholarship information and other specifics. Any questions, please do not hesitate to call our headquarters at (225) 923-3114.

**Post Your Coming Event Here** - email to [akfeditor@zk.kscoxmail.com](mailto:akfeditor@zk.kscoxmail.com)



# **AAZK Announces New Members**

## **New Professional Members**

Priya DeSoyza, **The Newark Museum Mini-Zoo (NJ)**; Michelle R. Farmerie, **Pittsburgh Zoo (PA)**; Amanda J. Matthews, **The Academy of Natural Sciences (PA)**; Paula Bohaska, **Calvert Marine Museum (MD)**; Nicole Lauren Kay, **Santa Fe Community College Teaching Zoo (FL)**; Ingrith Martinez, **The Lubee Foundation, Inc. (FL)**; George Smith, Jr., **Miami Metrozoo (FL)**; Miriam Rivera and Sharon D. Urban, **Lion Country Safari (FL)**; Shannon Lenerose, **Disney's Animal Kingdom (FL)**; John Farley, **Nashville Zoo (TN)**; Regan Slonecker, **Chattanooga Zoo (TN)**; Randal Pairan, **Cincinnati Zoo (OH)**; Maggie Werning, **International Exotic Feline Sanctuary (TX)**; Christy Bolden, **Brookfield Zoo (IL)**; Leonard Siwek, **Lincoln Park Zoo (IL)**; Corry Watkins and Sara Tomlinson, **Grant's Farm (MO)**; Melissa Martin, **Little Rock Zoo (AR)**; Deana Walz, **Utah's Hogle Zoo (UT)**; Larissa Strohofer, **Dal Ellington and Penelope Almond, Alameda Park Zoo (NM)**; and Jason Skaleske, **Scaramento Zoo (CA)**.

## **Renewing Contributing Members**

David R. Morris, President  
ZuPreem, Mission, KS

Marilyn R. Lemrow, Patron  
Zoological Society of San Diego  
San Diego, CA

## **Renewing Institutional members**

Catoctin Wildlife Preserve & Zoo  
Thurmont, MD

## **Cold Remedy Gives Orphaned Manitoba Polar Bears a Chance**

A common cold remedy could prevent orphaned Manitoba polar bear cubs from being placed in captivity, said a provincial conservation officer.

Vicks VapoRub® is helping female bears accept orphaned cubs, said Jack Dubois, director of wildlife and ecosystem protection with the Department of Conservation.

Each orphan cub is matched with a female bear that already has a cub and was trapped after wandering too close to humans. The bears are sedated and then the salve, which masks the unfamiliar scent of the orphan, is rubbed on both cubs and the mother's muzzle.

"When they wake up, by the time the mother has licked it all off she can't tell which cub is her own and which isn't," said Dubois. Later, conservation officials release the new family on the shore of Hudson's Bay, north of Churchill, where officials try to track the bears for five to 10 days. If a bear cub isn't abandoned after that length of time, it's unlikely it will be, said Dubois.

The treatment was first used last fall when conservation officials found four orphaned cubs. One match was tracked long enough for officials to conclude the cub was successfully adopted by its new mother, said Dubois. The other three families wandered off and couldn't be followed.

The technique was developed with the Born Free Foundation in England, which campaigns for the protection and conservation of animals in their natural habitat. *Source: The Canadian Press 7/03/03*



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**2003 AAZK NATIONAL CONFERENCE  
CLEVELAND, OHIO  
SEPTEMBER 26 – 30, 2003**



Well folks, it's almost here. All the food and beverage Cleveland has to offer is on reserve for the AAZK delegates. I hope you don't make us eat and drink it all alone. We are showering and putting on clean underwear, so please do us the honor of at least showing up! Here are a few reminders and notes.

**PROGRAM INFO**

To view a detailed edition of the program with specific times for the papers and workshops, go to the website [www.clemetzoo.com](http://www.clemetzoo.com)<

Conference Committee meeting will be at 1:00p.m. on Fri., Sept. 26 in the White Room.

**TRANSPORTATION**

The zoo shuttle for those parking at the zoo will tentatively run: Fri. Sept. 26 Noon to 6:00p.m. and then Sat. Sept. 27 thru Tues. Sept. 30, 7a.m. to 5:30 p.m.; and Wed. Oct. 1 from 8:00 a.m. to noon. For the Icebreaker, a shuttle will run from the hotel to Jacob's Field from 6:00 p.m. to 11:30p.m. The Icebreaker is also within walking distance of the hotel.

**REGISTRATION TABLE SCHEDULE**

Thursday, September 25	1p.m. to 5p.m.	Monday, September 29	8a.m. to 10a.m.
Friday, September 26	10a.m. to 8p.m.		5p.m. to 7:30p.m.
Saturday, September 27	8a.m. to 5p.m.	Tuesday, September 30	8:30a.m. to 12p.m.
Sunday, September 28	8a.m. to 5p.m.		

**ZOO DAY**

We have had an outbreak of births in our African Barns. On 2 Aug, our second Black Rhino was born - a female that weighs in at 106 lbs. Then, a female giraffe was born on 6 Aug, weighing 150 lbs. Two more giraffes are suspected to be pregnant and our zebra should give birth within the month. We don't know what is going on, but don't drink the water there when you tour these barns!

**EXHIBITORS**

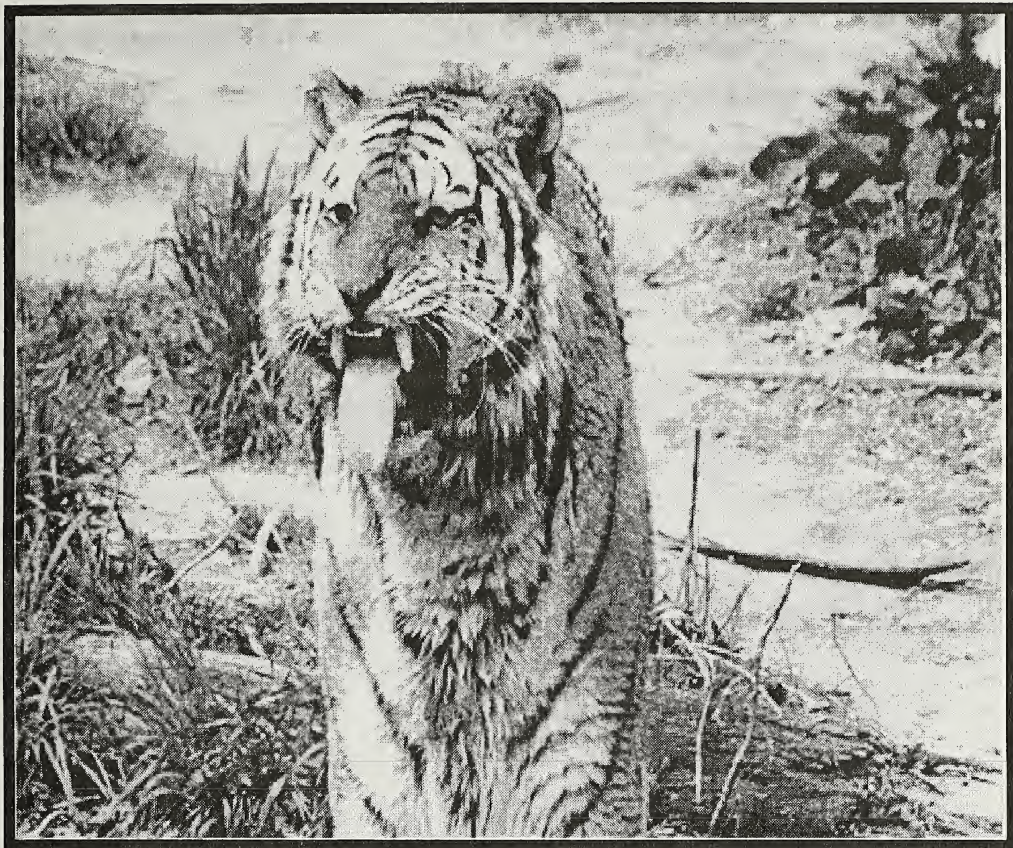
Bring your checkbook, because we have lined up 20+ exhibitors for you to browse and shop from.

**CLEVELAND CHALLENGE**

The results are in, on July 22, 2003, our Chapter drew the winning name for the "Cleveland Challenge". We are very pleased to announce the **Memphis AAZK Chapter** as the winner. One member will attend the Cleveland Conference *registration-free and hotel-free*.

In an attempt to increase the financial support by local Chapters to the National Conference, the "Cleveland Challenge" was instituted. Congratulations! We feel that this goal was accomplished. On average (in recent years), only 8 of 81 Chapters donate to the National Conference. We received 23 donations from Chapters, 16 of which participated in the "Challenge" (a minimum donation of \$250.00). The total amount donated was \$5900.00. Great job! A huge thank you to the following Chapters: Utah, Southern Ontario, Puget Sound, Memphis, Northern Lights, Central Florida, Little Rock, Point Defiance, Orange County, Detroit, West Michigan, Virginia, Lincoln Park, Cincinnati, Wildlife Safari, Dallas, Columbus, New Orleans, Indianapolis, Pittsburgh, Galveston, Greater Kansas City and Sedgwick County.





“Man, I hope the AAZK delegates taste better than the EMA ones did last year! They were sort of tough and chewy, not to mention the smell!”

**SEE YOU IN CLEVELAND !!**



# Monkey Pox Update

*submitted by Pete Riger, The Nashville Zoo, Nashville, TN*

On 11 June, 2003, the Centers for Disease Control and Prevention (CDC) and the Food and Drug Administration (FDA) issued a joint order prohibiting the importation of all African rodents into the United States. The joint order also banned within the United States any sale, offering for distribution, transport, or release into the environment, of prairie dogs and six genera of African rodents. The joint order was enacted as part of the public health response to the first reported outbreak of monkeypox in the United States.

The species included are: **Prairie Dogs** - *Cynomys sp.*; **Tree Squirrels or Sun Squirrels** - *Heliosciurus sp.*; **Rope Squirrels or Tree Squirrels** - *Funisciurus sp.*; **Dormice** - *Graphiurus sp.*; **Gambian giant-pouched rats** - *Cricetomys sp.*; **Brush-Tailed Porcupines** - *Atherurus sp.*; **Striped Mice** - *Hybomys sp.*

From the CDC website: <http://www.cdc.gov/ncidod/monkeypox/factsheet.htm>

## **Monkeypox: An Emerging Infectious Disease in North America**

Monkeypox is a rare viral disease that is found mostly in the rainforest countries of central and west Africa. The disease is called "monkeypox" because it was first discovered in laboratory monkeys in 1958. Blood tests of animals in Africa later found evidence of monkeypox infection in various rodent species. The virus that causes monkeypox was recovered from an African squirrel, which may be the natural host. Laboratory studies showed that the virus could also infect rats, mice, and rabbits.

In 1970, monkeypox was identified as the cause of a rash illness in humans in remote African locations. In early June 2003, monkeypox was reported among several residents in the United States who became ill after having contact with sick pet prairie dogs. This is the first evidence of community-acquired monkeypox in the United States.

## **Cause of Monkeypox**

The disease is caused by Monkeypox virus, which belongs to the orthopoxvirus group of viruses. Other orthopoxviruses that can cause infection in humans include variola (smallpox), vaccinia (used in smallpox vaccine), and cowpox viruses.

## **Signs and Symptoms**

In humans, the signs and symptoms of monkeypox are similar to those of smallpox, but usually milder. Unlike smallpox, monkeypox causes swollen lymph nodes. The incubation period for monkeypox is about 12 days. The illness begins with fever, headache, muscle aches, backache, swollen lymph nodes, a general feeling of discomfort, and exhaustion. Within 1 to 3 days (sometimes longer) after onset of fever, the patient develops a papular rash (i.e., raised bumps), often first on the face but sometimes initially on other parts of the body. The lesions usually develop through several stages before crusting and falling off. The illness typically lasts for 2 to 4 weeks. In Africa, monkeypox is fatal in as many as 10% of people who get the disease; the case fatality ratio for smallpox was about 30% before the disease was eradicated.

## **Spread of Monkeypox in Humans**

People can get monkeypox from an infected animal through a bite or direct contact with the infected animal's blood, body fluids, or lesions. The disease also can be spread from person to person, but it is much less infectious than smallpox. The virus is thought to be transmitted by large respiratory droplets during direct and prolonged face-to-face contact. In addition, monkeypox can be spread by direct contact with body fluids of an infected person or with virus-contaminated objects, such as bedding or clothing.

## **Treatment and Prevention**

Currently, there is no proven, safe treatment for monkeypox. Smallpox vaccine has been reported to reduce the risk of monkeypox among previously vaccinated persons in Africa. CDC is recommending that persons investigating monkeypox outbreaks and involved in caring for infected individuals or animals should receive a smallpox vaccination to protect against monkeypox. Persons who have had close or intimate contact with individuals or animals confirmed to have monkeypox should also be vaccinated. These persons can be vaccinated up to 14 days after exposure. CDC is not recommending pre-exposure vaccination for unexposed veterinarians, veterinary staff, or animal control officers, unless such persons are involved in field investigations.



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# ABC's

## ABC's: Animal Behavior Concerns and Solutions

*A Question & Answer Forum for Animal Professionals*

©2003 by Diana Guerrero, Independent Behavior Consultant  
Ark Animals of California, Big Bear Lake, CA



### Behavior 101: New Training Program Foundations

Each institution has unique needs related to implementing new training programs. There are many considerations to deliberate. Some involve the staff, while others will entail the exhibit or facility limitations, and finally there are the animal-related aspects. This column will focus on the foundation basics.

#### ASSESS THE ANIMALS

To assess your animals start with some basic questions:

- Do you have a history on these animals?
- Are they naive to the training process?
- Are they already tractable?
- What type of attention span does each individual have?
- What does each animal react to in a positive or negative manner?
- Are these trends consistent in the species, or are these inclinations only specific to certain individuals within your group?

You will ultimately have to design your program based on what your animals need and based around their experience with training or handling. Your approach will differ depending on whether or not you are working with veteran or naive animals, tractable or wild-caught individuals. Age and gender might affect your training, and seasonal fluctuations, such as weather or breeding cycles, can also impact your program. Identifying these factors and addressing them prior to implementing a training program will increase your likelihood of success.

#### DEFINE TOOLS & TECHNIQUES

Prior to implementation you must also define what techniques you will be using and what tools you will need. Review the literature related to the standard training techniques used in your industry and read any papers discussing the training of the same or similar species.

If you are using standard operant conditioning techniques you'll need to experiment to find what works most effectively. When using food items, make sure they are small enough that the animal will not spend excessive time chewing or eating, and so that the animal will not be tempted to move away from the trainer to chew.

In an operant program, there are necessary steps that will form the foundation of your training program. These are introducing and establishing a conditioned stimulus, and teaching the targeting



and stationing concepts. Tactile toleration and variables on these controlled behaviors can then be introduced as deviations later in the training process.

### **EXAMINE EXHIBIT & ROUTINE**

Remember to consider your unique exhibit and routine challenges. If you have problems with visibility, accessibility, or animal movement, be sure to outline solutions. Troubleshoot as much as you can before you encounter a problem so you have an action plan that can be implemented.

### **ADDRESS STAFF SKILL LEVELS**

The skill levels of your staff will also color the program design. Learn bridging techniques, and fine-tune your exhibit protocol on gates, doors, and chute as you plan your formal program.

Consistency and preparation are two critical factors to establishing a successful training program. You should outline ways to keep criteria clear and consistent for both humans and animals.

### **REMAIN FLEXIBLE & ADAPT**

It never hurts to dig up as much information as you can, but don't get so locked into specifics that you fail to be adaptable. Although training is a science, it is also an art form that requires adaptability and creativity. You will find that some things work well, while others may not. Go back to the discussion room and redirect your efforts when needed.

### **FOUNDATION COMPONENT: CONDITIONED STIMULUS AKA "BRIDGE"**

The conditioned stimulus is a process where the animal is taught to associate a marker (usually a sound) with the primary reinforcer (often a food item). This is popularly referred to as a bridging stimulus or "bridge." The bridge serves as an IOU for reinforcement. Once you teach the bridge and reinforcement concept to the animal (Bridge=Reinforcement), you will want to then obtain some basic control.

### **FOUNDATION COMPONENT: TARGETING & STATIONING BEHAVIORS**

Basic control of animal movement is done through targeting and stationing behaviors. Many trainers use these behaviors in conjunction with one another. A "target" behavior is usually a physical marker or tool used to position an animal. The animal is taught to respond to the target by touching it. The "station" behavior is usually a location the animal is taught to move toward and position at/on.

I have used both targeting and stationing behavior in conjunction with each other, but prefer to train an animal to respond to a target. Often, this is initially in relation to a specific location. With appropriate approximations, you can later move the animal to different location without confusion. If you have staffing shortages, this can be difficult to do.

### **TARGETING**

Teaching an animal to "target" means that you teach them to touch or position on some sort of physical mark or target. The item should be durable and easily manipulated or controlled by the trainer. These objects are often buoy floats positioned on a pole, colored geometric designs made of plastic or plywood, spotlights, or pointer sticks adapted for the task. Veteran trainers often have animals touch their fist or hand. For safety, it is advisable to avoid using your appendages.

Many trainers teach the animal to touch the target with their nose. As you and the animal become more astute, you might want to later get the animal to respond to a second target with its different body parts while holding position on the first. You can also introduce tactile toleration while the animal holds the primary target position. These, of course, are topics for another column.

Despite your best efforts at targeting (and stationing), some species will be fidgety. In these cases, you will want to introduce variations of the targeting behavior and develop protocol related to

behavior breakdowns. You might introduce “target following” or extend the time the animal holds position on the target.

## STATIONING

When dealing with group animals, establishing a stationing order is another early step in the foundation of your training program. Stationing is simply teaching an animal to position as asked. The animals within the group will learn to position consistency in relation to the trainer, a target, a location, or another animal.

The advantage for stationing by location, or positioning an animal in relation to a conspecific in the group, is that it often takes less manpower. One trainer can manage several animals at the same time. However, there can be other complications.

When training stationing behavior, trainers must be aware of the hierarchy within an animal group to ensure success. For instance, a subordinate animal might refuse to cooperate if the positioning or movement violates the pecking order protocol. The subordinate could be put at risk if a dominant animal perceives a breach of etiquette. Make sure the dominant animals are under training control so you avoid such hazards. This requires that you define the hierarchy within the group, and your strategies to dealing with possible challenges prior to training.

For further information I suggest perusing two past ABCS columns and the resources listed below. These are all available online in the Archive or SOS sections of the Internet site: [www.arkanimals.com](http://www.arkanimals.com)<

*(About the columnist: Since 1978 Diana L. Guerrero has worked professionally with both wild and domestic animals. Guerrero has been affiliated with and certified by a variety of animal programs in the USA and Europe. Based in California, she writes, consults, and leads safaris. Information on her animal career programs, training courses, and her newest book, What Animals Can Teach Us about Spirituality (SkyLight Paths, 2003) are available through her website. Questions for ABC's should be submitted to Diana directly through the ABC's questionnaire on her website, via email*

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## Three Types of Data Transfer Forms Available from AAZK

Just a reminder that three different types of data transfer forms are available to requesting institutions from AAZK at no charge. These forms are designed to be used whenever an animal is shipped from one facility to another so that important information on that animal can be passed on to the receiving keeper and veterinary staffs.

The following forms are available by contacting Barbara Manspeaker at 1-800-242-4519 (U.S.) and 1-800-468-1966 (Canada), or by emailing your request to [aazkoffice@zk.kscoxmail.com](mailto:aazkoffice@zk.kscoxmail.com)<

- Animal Data Transfer Form (ADTForm) - includes information on diet, reproductive history, general medical history/physical conditions, and enclosure/maintenance data on animal(s) being shipped.
- Enrichment Data Transfer Form (EDTForm) - includes information on behavioral history, enrichment currently used and how implemented (food, exhibit, artificial, etc.), safety concerns for animal(s) being shipped.
- Operant Conditioning Data Transfer Form (OCDTForm) - includes general background information, training specifications, training schedule, behaviors trained and methods used for animal(s) being shipped.

These forms are provided free of charge as a professional courtesy of AAZK, Inc. We encourage all zoos, aquaria and other animal care facilities to adopt the use of these forms when shipping animals. We extend our thanks to the following institutions for assisting in the printing expenses for these forms: Columbus Zoo (ADTForm), Arizona-Sonora Desert Museum (EDTForm), and Disney's Animal Kingdom (OCDTForm).



# Bowling for what?

*By Brian Czarnik*

*Animal Keeper Lowry Park Zoo, Tampa, FL*

*Wildlife on Easy Street, Tampa, FL*

*Florida Suncoast AAZK Chapter Secretary*

I remember the first time I heard the phrase "Bowling for Rhinos." My friend Anissa had told me to get out of the house and come to an AAZK meeting at the nearby Florida Aquarium. It was there amongst some fish and a few other keepers that I saw a slide show from the then and current AAZK President Kevin Shelton.

He had a million slides from the far away place in Kenya called Lewa Wildlife Conservancy. And at a table there were some books about Rhinos and some information on the upcoming Bowling for Rhinos event. Soon thereafter I joined the local chapter and learned about this annual event in which keepers from the local facilities bowl, win door prizes, bid on auction items and share a taste of the grape.

I was more than happy to pay my way (after hearing that 100% goes to the actual fund) and bowl and get my free T-shirt, but who were we really helping? This Lewa place seemed like some far-away utopia and I like rhinos, but big cats are my love. I wanted to start up another copycat event, so to speak, like "Lawn Darts for Lions" or maybe "Basketball for Bobcats."

I asked Kevin about the next available safari and within weeks I was calling him up to add my name to the lucky list for the June 2003 trip. I couldn't wait to see first-hand where our money was going and why this event for this Lewa place was so important. It would be my first safari and my first time overseas. The year quickly rolled around and I soon learned from other travelers that I was getting one heck of a bargain at around \$3,500.00 (close to my yearly salary, mind you) for a vacation of this sort.

The weeks before the trip were hectic as the State Department listed Kenya as a place it didn't want U.S. citizens to travel. Nothing short of the apocalypse would keep this determined group of 14 from going. We already had our vacation time approved and all, ya know.

After the nice flights to London (thanks to the London Zoo for letting us in for free!), and to Nairobi, we soon were in our small charter plane heading out to the Lewa camp.

As soon as we grew near Lewa, from our planes we saw a pride of lion hunting some zebra - an amazing sight that you only think you will see on Animal Planet.

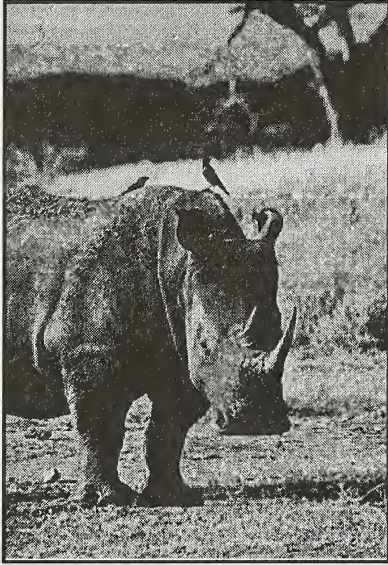
Our planes landed safely and we split up into two jeeps and drove back to camp. We all felt like we were on the latest installment of "Survivor" or something. It was on that first game drive back to camp that I finally took in what we all bowl for. I saw on the horizon a group of elephants, some white rhinos, vervet monkeys, zebra, gazelle, giraffe, eagles, and three cheetah boys lying under a tree - all on the first drive back to camp!

Over the course of the next ten days, I went out on every walk or drive they offered to see just what Lewa was all about. I saw dik dik, serval, sitatunga, crocodile, black and white rhino, warthog,





genet, lion, and so many different kinds of birds I can't even begin to write them all down. I couldn't believe how all of these animals could actually be in one place and to have these 55,000 acres (soon



they are getting another 15,000) almost to ourselves was unreal. At times (especially on some of the walks) I wished that the animals hadn't been so close, but nothing beats driving along with a herd of elephants and watching them play in a lake. And actually, nothing beats running for your life from a black rhino; or being forced up a tree by a white rhino for that matter. The sights we all saw will never leave our minds. The camp hosts, Sean and Judy-Anne, treated us all like kings and queens and we had three big meals every day. What fun it was to sit with keepers from around the U.S. and hear the good and bad about our facilities, and the sometimes-heated debates about animals and their welfare. Or to be thrown into the pool by the AAZK President (thought I had forgotten about that didn't you, Kevin!)

We were a tight group and after two weeks it felt like we were family. One big, happy zoo keeping AAZK family.

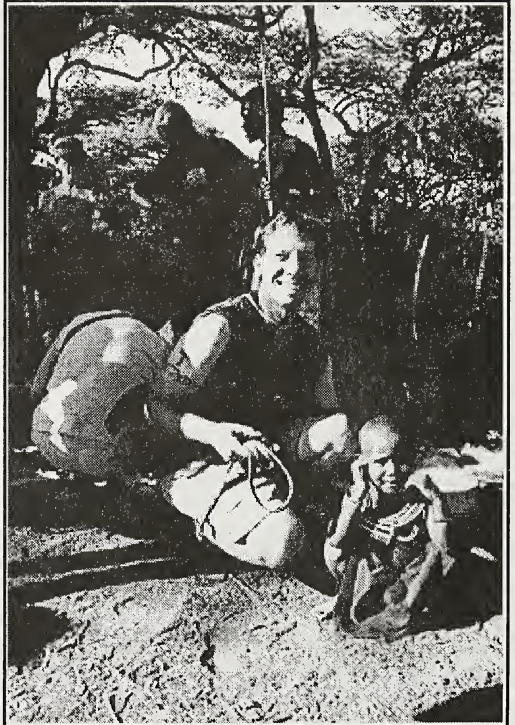
At Lewa, the policy is not to cull, but if the animal population becomes too great on one species, they will translocate them to another park. We saw first-hand on a giraffe capture, the love and care they give to their animals. Many of the employees come from the local Maasai tribe, which help benefit the local communities by providing jobs to these fine people. We all saw first-hand how our money goes to help the local schools by providing them with the rooms and supplies that they need. They showed us the plane, the truck and the uniforms for the wardens, that our yearly donations help purchase. Visiting the school was something no one on the trip will ever forget. The children sang us songs and a few hugged us, and when we left there wasn't a dry eye in the group. To say that these kids appreciated us would be the understatement of the year. Lewa is just as much about the people

as it is the wildlife. The communities benefit greatly by having tourist come see the wildlife. It generates income to help keep the schools free of charge for the local children.

There is so much happening at Lewa and I encourage all of you to at least visit their web site at: [www.lewa.org](http://www.lewa.org), to see a little of what our money is going to help.

So by this time we have all hopefully knocked down some pins for a place so far away. We should all pat ourselves on the back for getting behind a great cause for a facility that actually has both their heads and their hearts in the right place.

*Photos provided by the author*





be addressed by changes to the social and physical atmosphere. There are numerous dedicated and knowledgeable individuals currently working with elephants who should continue to do so and opportunities should be provided for these professionals to take an active role in the design, maintenance, and management of these sanctuaries. With the more natural conditions provided by these refuges, the reliance on training to provide for the welfare of the animals and the safety of the staff could be lessened or even eliminated. This dependency could then be replaced by observational research and studies that could benefit the wild populations while still allowing for a life worthy of an ambassador.

In light of the current status of the captive North American population of African elephant, it seems irresponsible that the import would be considered without first creating an environment that would promote well-being. And it seems self-destructive for zoos to allow themselves to be seen in a negative light by the experts in the field and to be bested by other institutions.

### Acknowledgements

My thanks to the staff of elephant facilities that responded to my questionnaire on the joint housing of African and Asian elephants. Approximately one-third of the survey's recipients responded and I will be forwarding on to all a summary of the findings. My thanks are also due to Carol Buckley, Dr. Anna Whitehouse, Dr. Phyllis Lee, and Dr. Joyce Poole for answering questions and pointing me towards source publications. Those whom I thank or reference are in no way responsible for any opinion, misconception, or inaccuracy that might be present in these pages and where indicated, the referenced sources should be studied for the author's viewpoint and intent.

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*Editor's Note: In a related item - ELEPHANT IMPORT DELAYED: A federal judge has refused to block the shipment of 11 African elephants to two U.S. zoos but will allow them to remain at a wildlife sanctuary in Swaziland pending appeal says the L.A. Times, AP 8/10. Several animal protection and rights groups are suing to stop the first importation of wild elephants into the U.S. in 15 years on grounds that it "violates" guidelines set by the Convention on the International Trade in Endangered Species (CITES). Source: GREENlines Issue #1928 8/14/03*

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## 6<sup>th</sup> International Zoo Design Symposium/Call for Papers

Paignton Zoo Environmental Park will host the 6<sup>th</sup> International Zoo Design Symposium at the Grand Hotel, Torquay, Devon, UK from 9-13 May 2004. The theme of the conference will be "**Zoo Design: Innovation or Replication?**"

Most zoos now regard themselves as Conservation Centers, and the Fifth International Zoo Design Symposium hosted by Paignton Zoo in 1998 recognized that in its title and theme "Conservation Centers for the New Millennium". Since then zoos have been very successful at tapping into new sources of capital funding, many new exhibits have been built, visitor numbers have increased, and the amount of resource zoos put into the conservation of wild animals has increased exponentially. By any standards it has been an extraordinarily successful period in zoo history. But, all that obvious success apart, has the art of wild animal exhibition moved on? Are we being genuinely innovative or are we simply rehashing and reprising good ideas from the past? Would Carl Hagenbeck be yawning in his grave?!

In 2003 Paignton Zoo Environmental Park will open the 'Living Coasts' Marine Mammal and Bird Exhibit at Torquay Harbour within sight and easy walking distance of the conference venue. The conference program will include a visit and reception at this unusual and striking exhibit. South Devon is also within easy reach of the world famous Eden Project and an optional visit to the project will be included in the program. For conference booking forms please telephone +44 (0) 1803 697502 or e-mail: [zodesign@paigntonzoo.org.uk](mailto:zodesign@paigntonzoo.org.uk). Further information can be obtained from our Website: [www.paigntonzoo.org.uk](http://www.paigntonzoo.org.uk)

### Call for Papers

Authors are invited to submit papers on all aspects of zoo design, particularly within the following areas:

- Spin or substance--does your design really do what it's supposed to do? How do you know?
- Plants - are they just a backdrop or an integral part of your conservation and education goals?
- IT - the good and bad
- Design conflicts - aesthetics, welfare, workability, conservation, education, research - can one exhibit do it all?
- Reconciling the irreconcilable - how to provide close contact while maximizing animal and visitor welfare.

Please send proposed title, authors, affiliations and an abstract (maximum 400 words) by email to [zodesign@paigntonzoo.org.uk](mailto:zodesign@paigntonzoo.org.uk). Please also complete the relevant section on the registration form on the website.



# Making A Connection

## A Save the Rhino Trust Journal

SAVE THE RHINO TRUST



*By Peter T. Hnath, Elephant Keeper  
Reid Park Zoo, Tucson, AZ*

In our daily lives as zoo professionals it is easy to forget the reasons why we are in this field of work. The fast pace of society keeps us constantly on the move- picking up the kids from school, grocery shopping, paying bills, car repairs, etc. We can quickly lose sight of the big picture and one of the fundamental points that we try to convey to everyone that passes through the gates of Reid Park Zoo: wildlife conservation.

With the generous support of the Tucson Zoological Society, I was able to spend two weeks participating in the field research and conservation efforts of one of the Save the Rhino Trust (SRT) rhino tracking teams in Namibia. The opportunity to experience the day to day life of the dedicated individuals who work for SRT is one I will never forget.

During the Rhino Keepers' Workshop of 2001, I met Blythe Loutit, founder of Save the Rhino Trust. She was there to create opportunities for zoo keepers to volunteer for SRT in Africa. For Blythe it all began in the early 1980's when she came across six elephant carcasses at a waterhole, mutilated to remove their tusks. At another waterhole three rhinos lay dead, riddled with bullet holes from automatic weapons. In this sparsely populated region of Namibia (then Southwest Africa), near the Skeleton Coast, the South African army and government had a free hand, the culture of hunting was prevalent, and shooting game was done in any way possible. Blythe, a botanical illustrator and artist, decided to take action.

With the assistance of her husband Rudi, a nature conservator in the area, Blythe worked with conservation- conscious businessmen and community leaders to establish the Namibian Wildlife Trust. This eventually led to the formation of the Save the Rhino Trust. They began pushing the idea of community-based conservation and immediately began working with the local people to develop conservation practices and alternative ways of supplementing livelihoods. The education of local communities to appreciate the non-use values of wildlife such as tourism was considered essential to conserving the rhino. At the same time, a small group of people began to patrol and monitor the area- specifically keeping an eye on the black rhino (*Diceros bicornus bicornus*) and the desert adapted savannah elephant (*Loxodonta africana africana*) populations. This was the basis of developing a community conservation system. Along with the goal of involving local people in the fight against the killing, was the aim of saving the wildlife of the western desert for the day when Namibia would be free from the "scorched earth" policy of previous rulers.

By 1990 Namibia was given its independence from South Africa and all of SRT's hard work was starting to pay off. In 1985 only 56 rhinos were counted during the first census; there are now over 130 records of individual rhinos. Gradually teams of trackers have been established to patrol the different rhino areas. Each team has its own vehicle, cameras, GPS (global positioning system), camping equipment, identification forms, binoculars, uniforms, rations and communication system. At present there are five teams of trackers in the field. Because of the vast distances covered and the rugged nature of the terrain, the teams often spend weeks at a time in the field. Each team must be completely self-sustaining and rely heavily on their equipment.

I already knew that this would be a very remote part of the world, with little outside communication and few of the amenities to which I have grown accustomed. I also knew that the trackers could cover 10-20 miles a day by foot when they were on the trail of a rhino. By the time I boarded my plane, my treadmill had hundreds of extra miles on it and all my camping gear was stuffed into one

very large bag. I felt prepared. Twenty-two hours later I landed at Walvis Bay, Namibia, where I was met by Bernd Brell, the project manager. From here it was a five-hour drive to the Ugab River Base Camp in the southern rhino range. On the way to camp I was given an overview of the operation. The southern tracking team consisted of Bernd and two trackers (Fulai and M'teos). There were 13 rhinos in the southern range and they were spread out over 5,000 sq. km. (~1930 sq. mi.) From the base camp the team would go out in the field for 4-7 days twice a month and cover as much area as they could. Since it was the beginning of the rainy season it would be exceptionally difficult to locate rhinos because there were many more seasonal waterholes to check. The black rhino, being a solitary species, would make the job even tougher.



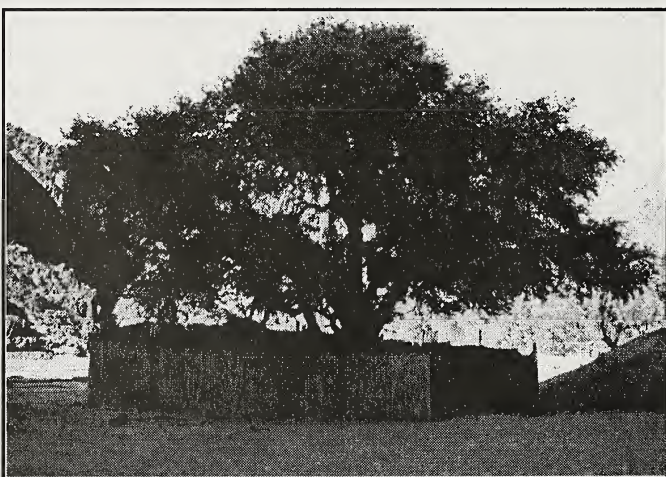
**Trackers Fulai and M'teos**

The ride was as exhilarating as it could be after a long flight. Walvis Bay is at the edge of the Namib Desert, the oldest desert in the world. The vast expanse of rolling sand dunes was a breathtaking sight. From there we traveled up the coast past the many shipwrecks that give the Skeleton Coast its name. Then it was inland east to an area known as Damaraland, a rugged rocky area that was carved from ancient volcanic activity. This habitat is home to the Welwitschia plant which can live to be over 1,000 years old.

When we finally arrived at the Ugab Base camp I felt like I was back in Tucson. Sand, scorching sun, bright blue sky and plenty of dry riverbeds. If you could replace all the

acacia trees with palo verde and mesquite you couldn't tell the difference. It was the beginning of summer and daytime temperatures were already in the mid- 90's. I was given a four-man domed tent nestled under a large acacia tree. Around it was a five-foot fence made from reeds for privacy. This would be home for the next two weeks, except for the times we camped in the field. The trackers called my tent site the "elephants favorite" because whenever a herd came through camp they would always feed from this tree. Bernd said he hadn't seen the herd for a while and couldn't be sure when they would be coming through again. Even though there was old elephant tracks and dung all around the camp, I wasn't expecting any elephant interactions.

That night after dinner I settled in for a good night's sleep. About 2100hrs that evening, while writing in my field journal, I heard the unmistakable sound of a large tree limb snapping. I knew only one animal was capable of doing that but the sound seemed to be coming from upriver so I kept on writing. A few minutes later -"snap"- only this time it was much closer. I shut off my light and sat on my cot listening for any noise that would signify that the herd was coming through



**"Elephant's Favorite" - the author's campsite**



camp. From my seat I could look out the tent window and view acacia branches silhouetted against a starry desert sky. I heard some shuffling around outside similar to the noise our elephants make when walking around the exhibit. Except it sounded like at least ten elephants. Next thing I knew, I saw two trunks reach up to pull seed pods from the acacia over my tent. Everything happened so fast after that. There was a trumpet, a series of low rumbles, bubble blowing from the well, defecating, urinating, flagellating, destruction of underground water lines and lots of foraging from my tree. At times there were so many pods falling on my tent that it sounded like rain. It was quite an auditory experience. It ended as quickly as it had began when they all moved down river for the night. Needless to say, I did not get much sleep the rest of the night.

The following morning the remainder of the herd came down river to join the troublemakers from the previous night. After spending a day at the waterhole the entire herd came through camp one last time before heading back up river. The final count was 22 elephants (four six-month old calves, two adolescent bulls and 16 cows). These elephants were part of only two groups of desert-dwelling elephants in the world. The other group lives in Mali, North Africa. They have adapted to their dry, sandy environment by having a smaller body mass and larger feet than most other elephants. Today over 300 elephants live in Western Namibia, 70 exclusively along the coast.

After two days with the elephants it was finally time to track rhinos. Bernd, two trackers and I packed up our Toyota 4x4 pickup with all the gear we would need for four days out in the field. This was the beginning of one of the most physically demanding experiences of my life. Our days started at sunrise (about 0600) and ended 10-12 hours later. By this time we were so exhausted that we could barely set up our camp for the night. Camp was simple. We parked under an acacia tree in a river bed, made a fire for cooking dinner, unloaded our bedrolls, cleaned up the best we could then fell asleep under the African sky.

Many nights we were serenaded to sleep by the sounds of local hyenas. The mornings were even simpler - boil water for coffee, pack up the truck and go.

During the day there were endless hours of driving over the most rugged, rocky terrain I had ever seen. When it got too rough for the truck it was time to set out on foot. Our search was concentrated on the existing waterholes in the area. Some days we hiked up to two hours just to reach one of these water sources. If there were no fresh tracks it was back to the truck and off to the next waterhole. If there was fresh evidence that a rhino had visited then we were off and running. There were days we hiked over 10 miles and up to six hours - sometimes without the payoff of finding our elusive quarry. It was certainly nothing to complain about because there was an endless amount of game to view along the way- mountain zebra, oryx, kudu, giraffe, springbok, etc.

The days we did find a rhino were very exciting and uplifting for the team. Not to mention dangerous. One day, after about an hour of tracking, we ran into Mike. He was one of the dominant bull rhinos in the area. Now, when I say "ran into" I mean literally. We were following a fresh trail and all had our eyes to the ground trying to figure out which way the trail went. The pace was slow because it



**Desert Elephant climbing up the river bank.**



was hard to pick up clues in this rocky area. A few bent blades of grass or an overturned rock could be the only hint which way to go. As soon as we reached the top of a small ridge, there he was, no more than 30 feet in front of us. We stopped dead in our tracks but it was too late. Mike spun around to face us, put his head down, snorted and charged. There were no trees or rocks to hide behind, he caught us in the open. He only took four steps in our direction but it was enough to make us scatter. After standing his ground for a few very uneasy minutes he triumphantly ran off. Occasionally he would look back to make sure we were not following. We were successful in tracking and recording seven of the 13 known rhinos in the southern range, but none more closely than Mike.



**“Mike” the rhino stands his ground**



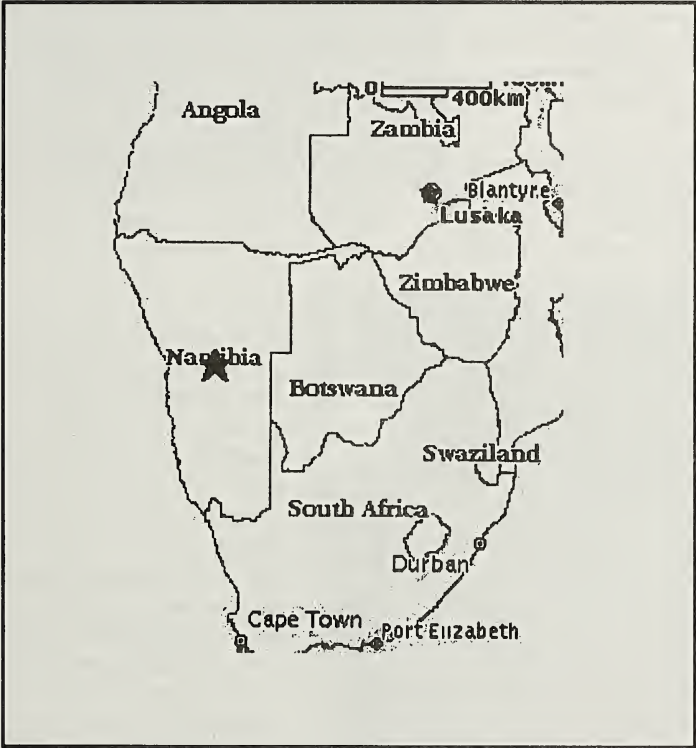
**Author Peter Hnath with truck and equipment preparing to head out on patrol.**



All notes collected in the field are entered into a database. Tracking teams are paid a bonus for each clear photo and accurate I.D. form that is turned in. Fecal samples are collected to obtain rhino DNA for the calculation of relatedness. If the rhino population is too closely related it may be necessary to translocate individuals to maintain genetic diversity. SRT's rhino project has been in full swing for many years and they are now beginning to gather data on the desert elephant population as well. With all of SRT's efforts there have only been three recorded cases of poaching in the last 10 years. All the poachers have been caught and have served time in prison.

After spending two weeks in the field with SRT staff it is easy to see the concern and dedication that is needed to make a field conservation program successful. These people have given up a "normal" lifestyle to save the wildlife in northwest Namibia. Their efforts have helped the desert rhino, along with other wildlife, survive and increase in numbers. Most importantly, without the support of traditional leaders and local communities this success story could not have been told. What we have to realize is that all of our information, every fact and figure that we recite to the public comes from people in the field- people who live and breathe conservation seven days a week. They are the real heroes.

*(Editor's note: Check out the Save the Rhino Trust website at <http://www.rhino-trust.org.na/>)*



# Options for Training Side Presentation for Large Canids and Felids

By  
*Angela Cecil Binney, Disney's Animal Kingdom*  
*Kim Kezer, Zoo New England and Jay Pratte, Dallas Zoo*  
of the  
*AAZK, Inc. Animal Behavior Management Committee*

## Introduction

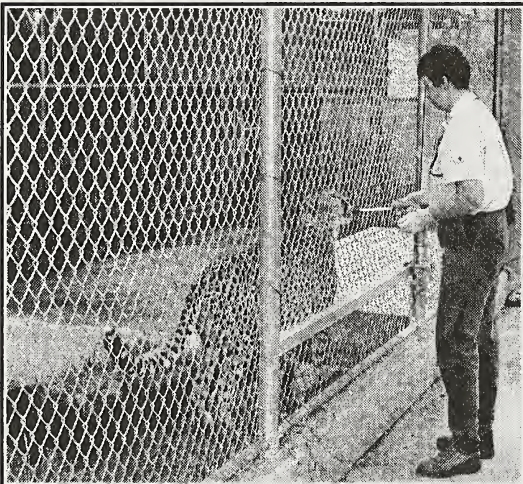
As with many aspects of animal husbandry, there is more than one way to train an animal to perform a specific behavior. This holds true for training large canids and felids to present their torsos for exam or procedure.

Side presentation may be more easily trained with some animals than others. In addition to studying the natural and individual history of an animal, the animal should also be acclimated to calmly approach the mesh for reinforcement prior to conditioning this behavior.

Assuming the subject is managed using 'protected contact,' the side presentation behavior involves the animal aligning parallel to, and leaning into the mesh until bridged. Ultimately, the animal should hold for a minor procedure (e.g., an injection). There are three basic steps in training this behavior, with multiple technique options. The following is a collection of techniques for each step that have worked with various large carnivores.

## Step 1: Options for conditioning the animal to turn parallel to the mesh

*Capture/Scan:* If the animal exhibits a natural tendency to rub on fencing (e.g., puma, lion, leopard), the first approximation is to 'capture' this. The animal should be reinforced while rubbing occurs and a conditioned stimulus, or cue, should be paired with the behavior.



**Figure 1:** A Disney's Animal Kingdom keeper demonstrates 'baiting' and 'environmental modification' (a log) as training tools in an off-exhibit holding area.

*Targeting:* Targeting in one direction, then quickly reversing the target, so the animal has to turn in the opposite direction, may get the animal's side close to the mesh as it turns to follow the target.

*Baiting:* Baiting this response with a meatball, can have the same effect as the target. Eventually, the meatball can be phased out so that just a visual or verbal cue is used.

*Environmental Modification:* For animals that present a challenge, environmental modification may help. This can range from simple to expensive and vary in design, depending on the facility and species. The least expensive way to accomplish this is to place an object near the fence, creating a physical barrier that leaves a space between the object and the fence. This creates a space in which the animal will have to walk parallel with the fence to enter. A large log has worked well for training this position with cheetahs and African wild dogs.

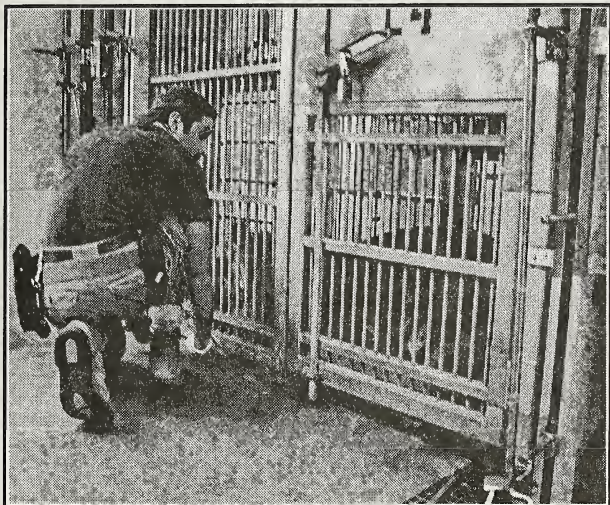


A transfer chute or crate can also provide a training area for the side presentation. It does not have to be so narrow that the animal can't turn around, as involuntary restraint is not the goal.

### **Step 2: Options for Shaping 'Lean In'**

**Body positioning:** For animals that do not tend to lean into the mesh, this aspect of the training will need to be shaped. Targeting the nose of the animal does not always arrange the torso close enough an exam or injection. Sometimes moving the animal slightly forward, using the head or nose target or a 'move up' cue, may get the sides closer.

**Body targets:** Targeting the hips can allow the trainer to approximate the torso toward the mesh.



**Figure 2:** A keeper uses 'targeting' to position 1.0 Indochinese tiger at the Dallas Zoo in an off-exhibit holding area.

After desensitizing to the presence of the body target, the animal should be reinforced every time the target touches its side. The next step is to hold the target slightly away from the body. Any shift of the torso into the target should be reinforced. Once voluntary movement toward the body target is trained, approximations can be used to get the torso closer. Pairing a verbal cue with this behavior will allow the trainer to phase out use of the target, freeing the trainer's hands of unnecessary instruments.

### **Step 3: Holding for Procedures**

Once the animal will attain this position on cue, it is time to condition holding the behavior. This involves slowly increasing the time lapse prior to the bridge. The introduction

of a 'hold,' 'stay,' or 'steady' cue can be an effective tool for this. Sometimes it is easier to introduce the hold cue with a less complex behavior (like 'sit' or 'target'). Once the animal is familiar with the criteria for the 'hold,' it may be easier to transfer it to more complex positions, such as 'side.' The final approximation is to desensitize to whatever procedure is needed in this position. Working slowly and ending all sessions positively will aid in reaching procedure goals.

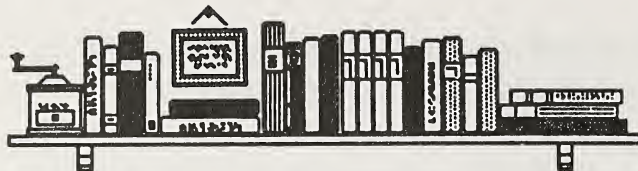
### **Conclusion**

A great way to gain ideas for training any behavior is to talk to other keepers. We can all learn by sharing our successful and unsuccessful techniques that have been used. There are often many methods available to achieve a training goal. However, all techniques will not work with every species or individual. The right way to train the behavior is the way that is safe, and works best for the particular subject being conditioned, in the facility in which it is housed. Determining this takes patience, intuition, observation, and often a little trial and error.

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## ***Happy Birthday, Starfire***

The Philadelphia Zoo's king cobra (*Ophiophagus hannah*) "Starfire" - at 25 years of age - might just be the oldest king cobra in captivity. The oldest king cobra on record lived a little more than 22 years. Native to India, this species is one of the largest of all poisonous snakes (can reach a length of 20 feet). Its venom is so deadly that one bite can bring down a tiger or even an elephant. Also unusual about the king cobra is that in the wild they live in pairs, a phenomenon that is rare in snakes.



# Book Review

## **Elephants I'll Never Forget. A Keeper's Life at Whipsnade and London Zoo**

By John Weatherhead, 2003

The Book Castle, 12 Church Street Dunstable, Beds. LU5 4R4, U.K.

ISBN 1-903747-16-3 182 pgs. paperback

Price: £9.99

Review by Geoff Creswell  
Emporia, Kansas

Anyone interested in the heyday of zookeeping will enjoy Weatherhead's memoir. His collection of anecdotes spans everything from employment in regimented English zoos headed by ex-military officers, to establishing collections in Saudi Arabia and the transportation of young Burmese elephants around the globe. Plenty of exotic locations and eccentricity without Discovery Channel theatrics. It is always good to see an old-school zoo book that is less concerned with political correctness than hands-on animal management. My only criticism is a lack of detail when the author refers to controversy.

The book is entertainingly penned in British English with plenty of interesting photos and gives a keeper's perspective of three decades of the Zoological Society of London - a zoo culture quite different than the American version. Whatever your perspective on politics of the animal business or the directions the author took, this book was written by someone who cares.

## **Marine Ornamental Species: Collection, Culture and Conservation**

By: James C. Cato and Christopher Brown

First Edition 2003, ISBN 0-8138-2987-9

Iowa State Press, 2121 State Avenue, Ames, Iowa 50014

448 pp Hardcover. \$119.95

Review by Bruce L. Elkins, Curator of Waters  
Indianapolis Zoo, Indianapolis, IN

*Marine Ornamental Species* is a very comprehensive look at the Aquarium industry from many of the current experts in the field. Dr. James Cato and Dr. Christopher Brown have edited together submissions from over 50 authors to provide a look at the current and future of marine ornamental livestock industry. After viewing the title, what surprises me most is the book is not just another attempt to spread gloom and doom in the name of conservation. It is actually very encouraging view of the trends that will be driving the marine life trade in the near future. Marine Aquarium Council certification is given much attention as it was the big announcement of the 2001 Marine Ornamentals meeting. It was also very useful for me as a member of an organization dedicated to supporting MAC certification. There is even an article discussing the relative costs of MAC certified fish vs. non-certified animals. Wild capture alternatives are investigated such as culturing stony coral, efforts to tank rear *Hippocampus abdominalis* - the Pot bellied Seahorse; to the use of new techniques to raise rotifers as food for captive larval fish. Chapter eleven authored by Austin Bowden-Kerby, is dedicated to the community-based management of reef systems and gives us a detailed picture of a unique social, economic and political mixture that can offer a sustainable reef management system.

While *Marine Ornamental Species* is meant as an overview of the various aspects of the Marine industry, I also find it useful as reference material for trends in marine life captive care. I already



mention the article by Chris Woods “Factors affecting successful Culture of the Seahorse, *Hippocampus abdominalis*, but there are articles on culturing marine fish larval, coral culture, shrimp aquaculture, as well a couple more articles on seahorse rearing. Each article can be read independent of the rest of the book, making it a significant reference tool.

*Marine Ornamental Species: Collection, Culture, and Conservation* is a very comprehensive overview of the marine ornamentals industry and a considerable source for marine life rearing and culturing information. It is well organized by the editors. The first Chapter, written by the editors and John S. Corbin gives us the results of a survey done at the Marine Ornamentals 2001 meeting which outline a set of Priority Recommendation for the industry. This alone makes the book important to have if you are involved in the marine industry.

### **A Practical Guide for Feeding Captive Reptiles**

By Fredric L. Frye (original 1991)

ISBN 0-89464-966-3

Krieger Publishing Company, Krieger Drive, Malabar, FL 32950

Hardback. 171 p. - \$26.50

*Review by Tracey Anderson, Instructor  
Zookeeping Technology Program  
Pikes Peak Community College  
Colorado Springs, CO*

Even though the world of captive animal management is ever-changing and continually being improved upon and updated, there are still some good reference guides out there that are greater than 10 years old. This is one of those references. Originally published in 1991, this book contains some of the basics that just haven’t needed modification. Of the 171 printed pages, 111 pages are dedicated to chapters on basic nutrition that includes information on water requirements, dehydration and gout, salt metabolism and frequency of feedings; nutrition-related illness and treatments which is beneficial in helping non-veterinary herpetologists with early recognition of potential problems; and food sources which includes some sample diets and recipes. This chapter includes information on the reproduction and culturing of several invertebrate food items. These chapters also contain several informative tables and charts that are all laid out in clear and easy to understand formats. These tables and charts would be very useful and handy to have at times when a quick reference guide was needed.

Some topics include food preferences for selected species of snakes, lizards, chelonians, most crocodilians and the tuatara, toxic as well as nutritious plants, food values, culture medium formulas and food sources to list a few. Once beyond the first 111 pages you’ll find extensive appendices that include US herpetological societies, glossary, references, cross-referenced species lists and the indexes of based both on taxonomic names and on general subject.

This book is a quick and easy read and it is chock full of good information. The majority of information in this book probably isn’t necessary for the more experienced or advanced herpetologist although the tables, graphs and appendices would be very useful to reptile hobbyists and herpetologists of all levels. Even though there isn’t much information pertaining to feeding presentation or technique I found this book to be a good “practical guide” especially for the beginning herpetologist that needs some reliable basic guidelines with which to start.

*Institutions wishing to advertise employment opportunities are asked to send pertinent data by the 10th of each month to: Opportunity Knocks/AKF, 3601 SW 29th St., Suite 133, Topeka, KS 66614-2054. Please include closing date for positions available, and when setting these dates keep in mind that because of bulk-mail, most readers do not receive their AKF until the middle of the month or later. There is no charge for this service and fax or e-mail listings of positions which become available close to deadline are accepted. Our Fax is (785) 273-1980; e-mail: akfeditor@ztk.kscoxmail.com< Listing may be sent as MS Word attachment. We are no longer located at the Topeka Zoo, so please note new address to avoid delays in processing.*

#### **Mammal/Bird Keeper - Cougar Mountain Zoo, Issaquah, WA**

Please send a cover letter and resumé to: Cougar Mountain Zoo, 19525 SE 54th, Issaquah, WA 98027; or Fax to (425) 392-1076; or E-mail to CougarMZoo@aol.com< This is a Full Time permanent position, benefits included. Salary depends on experience. **Responsibilities:** animal keeping involving some of the following species: cougars, lemurs, hoofstock (reindeer/antelope/deer), macaws, parrots, cranes and others. Daily routine husbandry, maintenance of exhibits, record keeping, assist in veterinary practices, behavior enrichment, etc. Involvement in Education such as tour guide, mini lecture speaker, animal demos and walks, outreach presentations, etc. **Requirements:** Ability to work in a harmonious manner with staff, volunteers and supervisors and work any of the seven days of the week. Prefer AS/BS degree in biology/zoology-related field and minimum of two (2) years full-time paid experience in zoological institution.

#### **Keepers/Vet. Technicians - The Hattiesburg Zoo, Hattiesburg, MS**

For more information regarding this position please contact John Wright, General Curator, Hattiesburg Zoo, Hattiesburg, MS 39401, (601) 545-4576, email: jwright@hattiesburgms.com< This is a full-time position with state benefits, salary commensurate with experience and qualifications. **Responsibilities:** The Hattiesburg Zoo is currently updating its Animal Care candidate pool. We seek career-driven, creative, team-oriented individuals. Future openings, will be responsible for, but not limited to the following; daily husbandry, exhibit cleaning and maintenance, diet preparation and feeding, documentation, conditioning and training of collection, educational programs, and veterinarian assistance. **Requirements:** Job requires minimum high school graduate (college degree preferred), one (1) year experience at an AZA institution (paid or volunteer), experience with a diverse collection.

#### **Zoo Keeper/Grasslands - Audubon Zoo, New Orleans, LA**

Send resumé to: Director of Human Resources, Mike Burnett, 6500 Magazine St., New Orleans, LA 70118 or email to: mburnett@auduboninstitute.org<

**Requirements:** Good written/oral communication skills and the ability to work effectively in a team-oriented environment. Associate's degree in biology or related field and one (1) year experience preferred or equivalent combination of training/experience in the care of mammals, preferably hoofstock, carnivores and primates. All candidates must have the ability to lift 80 lbs. and a willingness to work outdoors. A willingness to work weekends, holidays, and/or overtime is also required.

#### **Aviculture Interns**

For more information on internships at KBCC, please send a resumé, cover letter, and the names and contacts of three (3) references to: Tracey Goltz P.O. Box 39 Volcano, HI 96785 or fax: 808-985-7034. **OR**, for more information on internships at MBCC, please send this information to: Mary Schwartz 2375 Olinda Road Makawao, HI 96768 or fax: 808-572-3574. For the Hawaii Endangered Bird Conservation Program at the Keauhou Bird Conservation Center (KBCC) on the Big Island of Hawaii and the Maui Bird Conservation Center (MBCC) on the island of Maui. **Responsibilities:** Daily tasks include husbandry duties such as: diet preparation, aviary and facility maintenance, behavioral observations of breeding birds, grounds keeping, predator control. **Requirements:** Applicant must be able to live with several roommates in a remote area and should show enthusiasm for work with captive endangered Hawaiian birds. Applicant must have a valid driver's license and health insurance. Internships last for a 3-6 month period. Interns receive \$20/day stipend plus housing. **Please, no phone calls or emails.**

#### **Service Opportunities or Internships**

See additional information and application at our website - [www.tigercreek.org](http://www.tigercreek.org)< Commencement date: Open. Duration: Month by Month. Interested in learning more about big cats and a career path? Consider a service opportunity at TCWR. Two (2) positions currently available at Tiger Creek Wildlife Refuge, Tyler, TX. Interns are utilized for animal care positions through a qualification system. We provide: Room & Board, Materials and Curriculum, Indoctrination and Safety Training, Opportunity for full-time paid animal keeper positions (after training).



### **Marine Mammal Internship**

Interested candidates should submit a cover letter and resumé, transcripts, three (3) letters of recommendation, and an application from our website at [www.njaquarium.org](http://www.njaquarium.org). Please submit materials to New Jersey State Aquarium, c/o Nicole Begley, One Riverside Drive, Camden, NJ 08103. **Responsibilities:** Learn daily activities involving animal care and training with our Seal Team. Duties include food preparation, exhibit cleaning, creating enrichment devices and observing training.

**Requirements:** Candidates should be comfortable with public speaking, have course work in biology/psychology, prior animal experience, be able to work outdoors, and lift 50lbs. Interns are required to complete a minimum of 120 hours and must be registered for college credits in either a two or four year school. Internships may be completed during spring, summer, or fall sessions. All intern positions are on a volunteer basis and are unpaid

### **Internship Opportunities - National Aquarium in Baltimore**

To apply for any of the following internship positions go online at [www.aqua.org/education/internships](http://www.aqua.org/education/internships) to obtain an application form. A complete application includes contact information, answers to brief statements listed, and a copy of college transcript. Complete applications should be sent to: National Aquarium at Baltimore-Internships, Pier 3/501 East Pratt St., Baltimore, MD 21202.

Application Deadline: ongoing - 1 November 2003 for January and Spring terms of 2004; 1 April 2004 for Summer and Fall 2004 terms; All interns must complete a minimum of 120 hours of work within the selected term. Interns must receive college credit for their internship. Internships are unpaid. For further information contact the National Aquarium in Baltimore's Internship coordinator at [intern@aqua.org](mailto:intern@aqua.org) or call (410) 576-3888.

#### **Aquarist Intern**

**Responsibilities:** The selected candidate will assist the Aquarium aquarist staff with daily care of the Aquarium's invertebrates and fish. Assist with tank maintenance and cleaning; Prepare daily diets and perform daily feedings; Assist in the maintenance of back-up areas; Conduct precise record keeping; Perform special projects to be determined by the aquarist staff. **Requirements:** College juniors or seniors enrolled in an accredited college, pursuing a degree in Biology, Ecology, Environmental Science, or a related field. Must be able to lift 50 lbs, climb up a 6' ladder, and be able to squeeze across a 15' long x 12" wide platform.

#### **Aviculture Intern**

**Responsibilities:** The selected candidate will assist the Aquarium aviculture staff with daily husbandry activities in the South American Rainforest exhibit. Assist with and perform diet preparation and distribution; Conduct animal observations; Assist in the cleaning of holding areas, kitchen, and food prep areas; Provide enrichment to the aviculture collection; Perform special projects at be determined by the aviculture staff. **Requirements:** Interest in working with birds. Enrolled in an accredited college, pursuing a degree in Biology, Zoology, Animal Behavior, Ecology, Environmental Science, or a related field.

#### **Herpetology Intern**

**Responsibilities:** Tend the "Hidden Life" exhibits (large wall terrariums where small, neotropical lizards, frogs, snakes and invertebrates are on public display); Mist and clean the off-exhibit colony of small arboreal lizards; Mist, clean and otherwise help tend the large, off-exhibit collection of neotropical frogs; Prepare diets for and feed the on and off-exhibit iguanas and tortoises; Tend the locust (live food) colony, orb-weaving spiders and colonies of non-venomous exotic arthropods (wood and hissing roaches, millipedes and walking sticks); Assist in the maintenance of the live food cultures (fruit flies, springtails, crickets, rats, mice); Conduct and record animal observations; Perform special projects as determined by the herpetology staff. **Requirements:** Must be enrolled in an accredited college, pursuing a degree in Biology, Zoology, Animal Behavior, Ecology, Environmental Science or a related field. Must be comfortable working with frogs, lizards, rodents and terrestrial arthropods.

#### **Horticulture**

**Responsibilities:** The selected candidate will assist the Aquarium horticulture staff with daily activities. Assist with care of plants in the Rain Forest exhibits; Conduct plant maintenance, fertilization, propagation, and transplantation; Assist in display development; Perform special projects at be determined by the horticulture staff. **Requirements:** Must be enrolled in an accredited college, pursuing a degree in Biology, Ecology, Environmental Science, or a related field.

#### **Marine Animal Rescue Program (MARP) Intern**

**Responsibilities:** The selected candidate will aid in all aspects of marine animals rescue program (MARP) operations, which involves the rescue, rehabilitation, and release of stranded marine mammals and sea turtles and implementing outreach efforts of the Aquarium's Ocean Health Initiative. The selected candidate is also responsible for technical and clerical assistance for the Conservation Department staff as necessary. **Duties include:** Animal Care – participating in rescue and release trips, daily feeding, medical treatments,

facility maintenance including cleaning and water changes, behavioral observations, and record keeping; Outreach – learning to interpret the MARP artifacts and conservation messages and participation in seasonal outreach and public education programs at the Aquarium and off site; Other duties as assigned – field work, etc. **Requirements:** Must be college junior or senior majoring in environmental science or related field with course work in biology and ecology. Summer and January terms require 40 hours per week of work for 4 weeks. Spring and fall terms require 8 hours per day, one day per week of work.

#### Marine Mammal Trainer Intern

**Responsibilities:** The selected candidate is responsible for providing support to the marine mammal training staff. This internship's primary purpose is to teach the intern training theory. ***There is limited hands-on animal contact during the internship.*** **Duties will include:** Prepares daily animal diets and dispenses vitamins as instructed; Responsible for the cleanliness and safety of all animal back-up areas; Assists in training, husbandry, and medical sessions; Participates in pre-show and pre-session preparations; Periodically participates in sessions involving swimming during enrichment and play sessions – no animals involved; Other duties as assigned. **Requirements:** Must be college junior or senior majoring in life science or related field. Must have a basic understanding of marine mammal natural history. Must have good swimming skills. Must work well as a team member. Summer and January terms require 40 hours per week of work for 4 weeks. Spring and fall terms require 8 hours per day, one day per week of work.

#### Water Quality Lab Intern

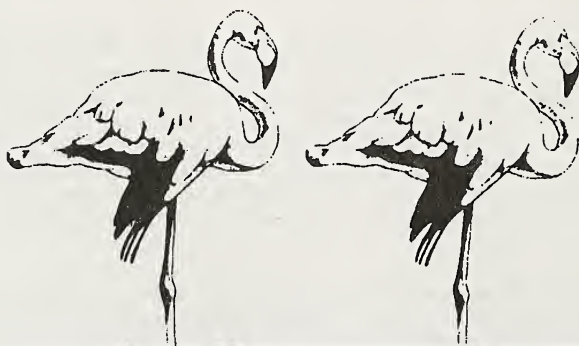
**Responsibilities:** The selected candidate will assist in the water quality testing of all fish and mammal systems throughout the aquarium. Duties include testing water for salinity, pH, ammonia, nitrite, alkalinity, and copper according to lab procedures, and recoding neat, accurate data. The selected candidate will work closely with the Lab Technicians and the Animal Husbandry staff. **Requirements:** Must be college junior or senior with general biology and chemistry work. Strong math skills and computer proficiency preferred. Must be available to work mornings.

#### SOS Rhino Seeks Volunteers

SOS Rhino is looking for volunteers interested in helping us in our efforts to save the Sumatran rhinoceros. Our Borneo Team is studying the demographics of the remaining animals in Tabin Wildlife Reserve to determine when patrol units, habitat protection, or translocation may play a role in the rhinos' survival. Please visit SOS Rhino's web site for detailed information: <http://www.sosrhino.org/programs/volunteer.php> Or contact Cindy Salopek, Projects Associate/SOS Rhino via e-mail at: [cindy@sosrhino.org](mailto:cindy@sosrhino.org)

*Positions posted with AAZK, Inc. may also be found on  
our website at [www.aazk.org](http://www.aazk.org)*

*Also, you may want to check out the AZA Member Institution job listings  
at <http://www.aza.org>*



## **MOVING?**

Please let us know when you change your address! It now costs AAZK 99 cents every time an AKF is returned because of an incorrect address. Call 1-800-242-4519 (U.S.) or 1-800-468-1966 (Canada) or e-mail [aazkoffice@zk.kscoxmail.com](mailto:aazkoffice@zk.kscoxmail.com) to report your new address.



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**\$35.00 Associate**  
*Those not connected with  
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Work Area \_\_\_\_\_

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Mail this application to: AAZK Administrative Offices, 3601 S.W. 29th, Suite 133 Topeka, KS 66614-2054. Make checks/money orders payable to AAZK, Inc. Must be in U. S. FUNDS ONLY. Membership includes a subscription to *Animal Keepers' Forum*. The membership card is good for free admission to many zoos and aquariums in the U.S. and Canada.

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# **ANIMAL KEEPERS' FORUM**



**The Journal of the American  
Association of Zoo Keepers, Inc.**

**OCTOBER 2003**

**Managing Editor:** Susan D. Chan • **Associate Editors:** Gretchen Ziegler, Sequoia Park Zoo & Kayla Grams, Lovell, WY • **Enrichment Options Coordinators:** Dawn Neptune, Utah's Hogle Zoo & Rachel Cantrell, Disney's Animal Kingdom • **Legislative Outlook Column Coordinator:** Georgann B. Johnston, Sacramento, CA. • **ABC's Column Coordinator:** Diana Guerrero, Big Bear Lake, CA • **Reactions Column Coordinator:** William K. Baker, Jr., Little Rock Zoo • **The Water Column Coordinators:** Dan Conklin and Kevin Shelton, The Florida Aquarium and Bruce Elkins, Indianapolis Zoo

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**AAZK Executive Director:** Ed Hansen, AAZK, Inc., Topeka KS  
also serves as AAZK Liaison to the American Zoo & Aquarium Association (AZA)

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### **AAZK PUBLICATIONS - CONTINUING DATA COLLECTION**

Biological Information (formerly Biological Values), 4th Edition - Jan Reed-Smith, Columbus Zoo

AAZK Enrichment Notebook 3rd Edition - Lee Houts, Folsom City Zoo



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## About the Cover.....

This month's cover features a Greater Kudu (*Tragelaphus strepsiceros*) drawn by Jeff Wells, an Animal Keeper in the Ituri Forest at Diensy's Animal Kingdom. The Greater Kudu is one of the most impressive of all antelopes. They are the second largest of the tragelaphine antelopes, which includes the bongo, nyala, bushbuck, sitatunga, and the eland. Males weigh from 400-700 lbs. (181-317kg) and sport a spectacular pair of spiral horns that sometimes reach lengths of up to 70 inches (178cm). Females are slightly smaller and lack horns. Their color ranges from reddish brown to charcoal gray with six to ten lateral stripes present along the sides of the body. The Greater Kudu's range includes eastern and southern Africa. Their populations are most dense in southern Africa with East African populations being broken up and extending into the mountains. They are highly adaptable and can co-exist in close proximity to human habitation if otherwise undisturbed. Calves are born during the rainy season after a gestation period of approximately 212 days. The Greater Kudu currently are not endangered, but still highly prized by trophy hunters. Thanks, Jeff!

Animal Keepers' Forum publishes original papers and news items of interest to the animal keeping profession. Non-members are welcome to submit articles for consideration. Articles should be typed or hand-printed and double-spaced. Authors are encouraged to submit their manuscripts on a disk as well as in hard copy form. Manuscripts submitted either on disk or electronically as attachments to an email should be submitted in Microsoft WORD. All illustrations, graphs, charts and tables should be clearly marked, in final form and should fit in a page size **no greater than 5.5" x 8.5"** (14cm x 22cm). Literature used should be cited in the text (Brown, 1986) and alphabetically in the final bibliography. Avoid footnotes. Include scientific name (as per ISIS) the first time an animal name is used. Thereafter use common name. Use metric system for weights and measurements (standard equivalents may be noted in parenthesis). Use the continental dating system (day-month-year). Times should be listed as per the 24-hour clock (0800, 1630 hrs. etc.). Glossy black and white or color prints (minimum size 3" x 5" [8cm x 14cm] ) are accepted. Clearly marked captions should accompany photos. Please list photo credit on back of photo. Photographs may be submitted electronically as either JPEG or TIFF file attachments.

Articles sent to Animal Keepers' Forum will be reviewed by the editorial staff for publication. Articles of a research or technical nature will be submitted to one or more of the zoo professionals who serve as referees for AKF. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Lengthy articles may be separated into monthly installments at the discretion of the editor. The editor reserves the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed, appropriately-sized envelope. Telephone, fax or email contributions of late-breaking news or last-minute insertions are accepted as space allows. Phone 1-800-242-4519 (US); 1-800-468-1966 (Canada); FAX (785) 273-1980; email is [akfeditor@zk.kscoxmail.com](mailto:akfeditor@zk.kscoxmail.com)

**Deadline for each regular issue is the 10th of the preceding month.**

**Dedicated issues may have separate deadline dates and will be noted by the editor.**

Articles printed do not necessarily reflect the opinions of the AKF staff or the American Association of Zoo Keepers, Inc. Publication does not indicate endorsement by the Association.

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E-Mail Addresses: You may reach Barbara Manspeaker at AAZK Administrative Offices at: [aazkoffice@zk.kscoxmail.com](mailto:aazkoffice@zk.kscoxmail.com) You may reach Susan Chan and Animal Keepers' Forum at: [akfeditor@zk.kscoxmail.com](mailto:akfeditor@zk.kscoxmail.com)

**AAZK Website Address: [www.aazk.org](http://www.aazk.org)**

**BFR Website: <http://bfr.aazk.org>**



# *Scoops & Scuttlebutt*



## **Chapters, Members Donate to AAZK Supported Projects**

The Association has received the following donations supporting programs in which AAZK is involved: \$150.00 from the Greater Cleveland Chapter of AAZK (Cleveland Metroparks Zoo) for the First International Congress on Zookeeping being held in Amsterdam, The Netherlands this month; \$500.00 from the Dallas Zoo Keeper Association (Dallas Zoo) to help fund the Adopt-A School lunch program (see related story pg. of this issue); and \$50.00 from individual AAZK member Linda Kunze, Tyler, TX, in support of the Adopt-a-School program.

The Association thanks all those associated with these donations for their commitment to helping to fund AAZK-sponsored programs and projects.

## **OKC Zoo Sponsors Field Techniques Training**

The Oklahoma City Zoo and Botanical Garden is offering a wildlife field techniques training course to be held 5-19 December 2003. Participants will learn the techniques of trapping, radio telemetry, data collection and habitat analysis. Course will be held in the El Cielo Biosphere Reserve located in the Sierra Madre Oriental of Tamaulipas, Mexico.

The course is offered in conjunction with the margay research program sponsored by the OKC Zoo. The goal of the program is to study the ecology of the endangered margay including activity patterns, spatial requirements, diet and habitat use.

Fees for the training course are \$1500.00 which include travel, food and lodging while in Mexico. Participants are responsible for personal travel to Harlingen, TX.

For more information, contact Patricia Downey at [margayresearch@okczoo.com](mailto:margayresearch@okczoo.com). If you are interested about receiving college credit hours for your participation please specify in your first e-mail.

## **SAZARC Appeals for Support of Conference**

AAZK has received an appeal from Sally Walker, Patron/Administrator of SAZARC (South Asia Zoo Association for Regional Cooperation) for financial assistance for some individuals wishing to attend this conference. Zoos involved in SAZARC include those in Bangladesh, India, Bhutan, Nepal, Pakistan and Sri Lanka. The meeting for which they are seeking funding will be held from 1-7 December 2003 in Sri Lanka. These meetings are informational and training sessions for zoo staff from participating countries. The primary topic for this 4th annual gathering is Zoo Nutrition. The goals of SAZARC include promoting a greater understanding of the need for conservation of imperiled species in these countries, education for zoo staff members on important husbandry and veterinary topics, working toward enactment of progressive zoo legislation in the participating countries, and sharing information among the zoological facilities.

Funding is needed to help cover costs of airfare and accommodations for some of the participants who do not have personal income to cover the expenses and whose zoos are unable to provide financial support. Costs per participant will vary from \$500 to \$1300 depending on the distance they are coming to the conference. If you or your AAZK Chapter are interested in helping out, you may contact Sally Walker at [zooreach@vsnl.com](mailto:zooreach@vsnl.com)< Their website is [www.zooreach.org](http://www.zooreach.org)<

## **AAZK Website Has New Look - Check It Out!**

For those of you who haven't visited the AAZK, Inc. website recently you may want to stop by. It has a brand new look and new navigation which should make it easier to find your way around the site. There are also two new sections which have been added: the Animal Behavior Management Committee and Enrichment Committee both have informational sections on the new site. This is the first phase of the restructuring with more to come down the road. Any suggestions and/or comments are welcome. Again make sure you stop by to see the new and improved site at <http://www.aazk.org>.

# Coming Events

**First International Conference on Zookeeping in 2003** - The Netherlands - Will be held between 2-10 October at Birdpark Avifauna. For further information please visit: [www.iczoo.org](http://www.iczoo.org)<

**American Association of Zoo Veterinarians** - 5-9 October, 2003 in Minneapolis, MN. For additional information, visit the AAZV website at [www.aazv.org](http://www.aazv.org) or contact Wilbur Amand, VMD, Executive Director/AAZV, 6 North Pennell Rd., Media, PA 19063; Phone (610) 892-4812; Fax (610) 892-4813; email [AAZV@aol.com](mailto:AAZV@aol.com)<

**The 2003 ChimpanZoo Conference** - 25-29 October, 2003 in Boca Raton, FL. The focus of the meeting will be "Long Term Care for Captive Nonhuman Primates". Additional information is available on the ChimpanZoo website at [www.chimpanzoo.org](http://www.chimpanzoo.org)< or by e-mail at [info@chimpanzoo.org](mailto:info@chimpanzoo.org) or by phone at (520) 621-4785.

**The Sixth International Conference on Environmental Enrichment** - 2-7 November 2003 in Johannesburg Zoo, South Africa. Sixth International Conference on Environmental Enrichment in Johannesburg Zoo, South Africa. Hosted by the Johannesburg Zoo. For more information on the conference, including fees, registration facilities, reduced flights and pre- and post-conference tours, please go to [www.jhbzoo.org.za](http://www.jhbzoo.org.za) or contact Mathew van Lierop at [mathew@jhbzoo.org.za](mailto:mathew@jhbzoo.org.za) or on +83 600 2677.

**Karen Pryor Clicker Expos 2003/2004**

7-9 November 2003, Chicago, IL; 23-25 January 2004, Berkeley, CA; and 26-28 March 2004, West Chester, PA. Each Clicker Expo will feature 15 main stage presentations and 18 workshops over three days. Topics will cover the latest operant conditioning techniques utilized for domestic as well as zoo and aquarium animals. For a full schedule and registration information, visit [www.clickertraining.com](http://www.clickertraining.com)<

**ACVP/ASVCP 2003 Concurrent Annual Meeting** - American College of Veterinary Pathologists and American Society of Veterinary Clinical Pathology joint meeting - 15-19 November, 2003 in Banff, Alberta, Canada. For more info contact ACVP at: Phone - (608) 833-8725 ext. 145; Fax - (608) 831-5485; email - [meetings@acvp.org](mailto:meetings@acvp.org); web - [www.acvp.org/meeting/](http://www.acvp.org/meeting/)

**First Annual Crissey Zoological Nutrition Symposium** - 12-13 December 2003 in Raleigh, NC. To be held at the College of Veterinary Medicine, North Carolina State University. A

website with details and registration instructions is posted at <http://www.cvm.ncsu.edu/info/ce/zoonutrition.htm>< Special sections this year will focus on Primate Nutrition, Food Safety, Fiber and Forages, Vitamins and Minerals; as well as general sessions. Dr. Jay Kaplan of Bowman-Grey Medical School will be the keynote speaker, speaking on "Phytoestrogens and Health: What Can We Learn from Primates? An evening event on 12 December is planned for the general public.

**II International Tapir Symposium** - 10-16 January 2004 - in Panama City, Republic of Panama. Will bring together a multi-faceted group of tapir experts, including field biologists, educators, captivity specialists, academicians, researchers, veterinarians, governmental authorities, politicians and other interested parties. Session topics will cover field research, population management, husbandry, fundraising, marketing, governmental regulations, eco-tourism, education, veterinary issues and tapir bio-politics. Visit the Symposium website at <http://www.caligo.com/tapir/> for more information and registration details.

**International Polar Bear Husbandry Conference** 4-7 February 2004 in San Diego, CA. Polar Bear International (PBI) in association with the AZA's Bear TAG are cohosting this conference to be held at the Bahia Hotel on Mission Bay. They are bringing together many of the most experienced and knowledgeable "bear" professionals in the world, including noted scientists, zookeepers, and naturalists representing a broad spectrum of institutions. Information and online registration is now available on PBI's website (<http://www.polarbearsinternational.org>). This includes the invited speaker list (updated monthly) as well as the conference agenda, goals, scholarship information and other specifics. Any questions, please do not hesitate to call our headquarters at (225) 923-3114.

**AAV 25th Annual Conference & Expo** - 16-20 August 2004 - in New Orleans, LA at the Sheraton New Orleans Hotel. For further information call (303) 756-8380 or visit [www.conferenceoffice.com/aav](http://www.conferenceoffice.com/aav)<

**Post Your Coming Event Here** - email to [akfeditor@zk.kscoxmail.com](mailto:akfeditor@zk.kscoxmail.com)



# AAZK Announces New Members

## New Professional Members

Karen Weisenseel, **Zoo New England (MA)**;  
Jennifer Blackburn, **Buttonwood Park Zoo (MA)**; Brigitte Walls, **Bergan County Zoo (NJ)**;  
Kimberly Gasper, **Erie Zoo (PA)**; Christopher J. Johnson, **Zoo Atlanta (GA)**; Christina Talley-Stodd, **Lion Country Safari (FL)**; Kathy Downing, **Lake Leo Zoo & Sanctuary (FL)**;  
Kate Hughes, **Nashville Zoo at Grassmere (TN)**;  
Amanda McMullen, **Hattiesburg Zoo (MS)**; Jill Katka, **Louisville Zoo (KY)**; Amanda Nydegger, **Scovill Zoo (IL)**; Michael Lebanik, **Kansas City Zoo (MO)**; Darla Blundell, **Cedar Cove Feline Conservation Center (KS)**; Kimberly Anne Smith, **Sunset Zoological Park (KS)**; Lisa Keith, **Emporia Zoo (KS)**; Lola D. Curtis and Amy C. Davis, **Audubon Nature Institute (LA)**; James W. Beck, **Zoo of Acadiana (LA)**; Charity Chapman, **Little Rock Zoo (AR)**; Erin M. Johnson and Margaret Reynolds, **Moody Gardens Aquarium (TX)**; Mandy Hollingsworth, **Cheyenne Mountain Zoo (CO)**; Jennifer L. Evans, **The Tracy Aviary (UT)**; Kristi Martin, **Oakland Zoo (CA)**; and Lisa Triggs, **Pt. Defiance Zoo & Aquarium (WA)**.

## Renewing Institutional Members

Prospect Park Wildlife Center  
Brooklyn, NY  
Lewis Greene, Director

Salisbury Zoo Commission, Inc.  
Salisbury, MD  
James Rapp, Director

# Condor Update

Biologists are reporting that two California condors nesting in the Grand Canyon have successfully hatched a chick, "the first ever born in the Arizona wild since the start of a program to save the birds from extinction" reports the *Arizona Daily Sun*. The 18 to 26 week-old chick "appears to be healthy and happy" and according to the Peregrine Fund's condor program is "the first condor chick in Arizona in more than a 100 years."

Given the chick's size and age it has "cleared the most difficult hurdles" with "one more major hurdle to clear: flying." The successful fledging of the chick is seen as "a major milestone" of the reintroduction effort and "the top goal of the program since it started in Arizona seven years ago."

In a related story, a California man, who shot and killed a California condor during a pig hunt was sentenced to five years probation, 200 hours of community service and a \$20,000 fine according to the *L.A. Times*. According to the assistant U.S. attorney, who prosecuted the case for violating federal laws protecting migratory birds rather than the more stringent ESA, "In all respects it looked like he'd been a fine person, with the one exception of the hunting."

Sources: *GREENlines* Issue #1931 8-20-03 and Issue #1932 8-21-03



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# 2003 AAZK/AKF Award Recipients

The following are recipients of awards presented at the 30th Annual AAZK National Conference held in Cleveland, OH from 26-30 September, 2003. The Environmental Enrichment Award and the Certificate of Excellence in Exhibit Renovation are determined from nominations sent to the AAZK Awards Committee. Certificates of Appreciation and Recognition as well as the Distinguished Service Plaque are determined by the AAZK Board of Directors. The Excellence in Journalism Awards are given by the AKF editorial staff.

## Environmental Enrichment Award

presented to

Amy Davis, Frank Buck Zoo  
Gainesville, TX

for the development of a formal enrichment program for the zoo's animals. This included collecting and tracking enrichment items, and creating an enrichment rotation schedule and ratings system. Also noted was the development of an enrichment handbook for volunteers

## Certificate of Excellence in Exhibit Renovation

presented to

Sedgwick County Zoo  
Wichita, KS

for the renovation of an exhibit to house Caracals. The institution's keepers and staff have been recognized for their outstanding efforts to provide an enriching experience for both the caracals and the public

## Certificate of Appreciation

Cleveland Metroparks Zoo  
Cleveland, OH

AAZK 2003 National Conference Host Institution

## Certificate of Recognition

Linda King, Dallas Zoo, Dallas, TX

for her service from 1999-2003 on the AAZK, Inc. Board of Directors

Jan Reed-Smith, Columbus Zoo, Columbus, OH

for her service from 1999-2002 on the AAZK, Inc. Board of Directors

Jan Reed-Smith, Columbus Zoo, Columbus, OH

for serving as editor/coordinator of the Biological Information for Selected Mammals  
Fourth Edition/CDROM

Denise Wagner, San Diego Wild Animal Park, Escondido, CA

for the redesign of the AAZK, Inc. website and conversion  
of the Third Edition of the Enrichment Notebook to CDROM format



Jeannette Beranger, Roger Williams Park Zoo, Providence, RI  
for spearheading the First International Congress on Zoo Keeping

Shane Good, Cleveland Metroparks Zoo, Cleveland, OH  
for working on and support of the First International Congress on Zoo Keeping

Jeff Phillips, Disney's Animal Kingdom, Lake Buena Vista, FL  
for serving as the AAZK, Inc. National Conference Program Chair

Mark de Denus, Reid Park Zoo, Tucson, AZ  
for serving as Editor of the Junior Keepers' Journal

Michael Illig, Oregon Zoo, Portland, OR  
for unending devotion to making Bowling for Rhinos  
successful and saving wildlife worldwide

Virgil Baird, Toledo Zoo, Toledo, OH  
for unending devotion to making Bowling for Rhinos  
successful and saving wildlife worldwide

Norah Farnham, Woodland Park Zoo, Seattle, WA  
for unending devotion to making Bowling for Rhinos  
successful and saving wildlife worldwide

Kirsten Christensen, Rio Grande Zoo, Albuquerque, NM  
for unending devotion to making Bowling for Rhinos  
successful and saving wildlife worldwide

Julie Izold, Cleveland Metroparks Zoo, Cleveland, OH  
AAZK 2003 National Conference Chair

Shane Good, Cleveland Metroparks Zoo, Cleveland, OH  
AAZK 2003 National Conference Committee Chair

Heather Mock, Cleveland Metroparks Zoo, Cleveland, OH  
AAZK 2003 National Conference Committee Chair

Maureen Meslovich, Cleveland Metroparks Zoo, Cleveland, OH  
AAZK 2003 National Conference Committee Chair

Debra Kuscevic, Cleveland Metroparks Zoo, Cleveland, OH  
AAZK 2003 National Conference Committee Chair

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*published in July 2002 AKF*

Angela Miller, Animal Keeper, Disney’s Animal Kingdom, Lake Buena Vista, FL

“Training Sun Bears for Pole-Injection Through Operant Conditioning”  
*published in October 2002 AKF*

Carrie Weitz, Keeper, Lincoln Park Zoo, Chicago, IL and  
Meg Hudson-Dye, Animal Management Resources, Inc., LaGrange, IL

“Effects of Facility Modifications on Elephant Activity Levels”  
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Peter Hnath and Maria Yannesss, Elephant Keepers, Reid Park Zoo, Tucson, AZ

“Piping Plover (*Charadius melodus*)”  
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Karen Rabideaux, Zoo Keeper, Milwaukee County Zoo, Milwaukee, WI

“This Little Piggy Had a Hoof Trim: Training a Warthog for Hoof Work”  
*published in March 2003 AKF*

Pilar Hicks, Animal Keeper, Disney’s Animal Kingdom, Lake Buena Vista, FL

“Training a Pileated Woodpecker for Animal Shows”  
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Paula Blum, Animal Programs Coordinator  
Linda Barberis, Animal Programs Biologist II  
The Florida Aquarium, Tampa, FL

Outstanding Cover Art – African Elephant  
*published in January 2003 AKF*

Christine McKnight, Keeper  
Minnesota Zoo, Apple Valley, MN



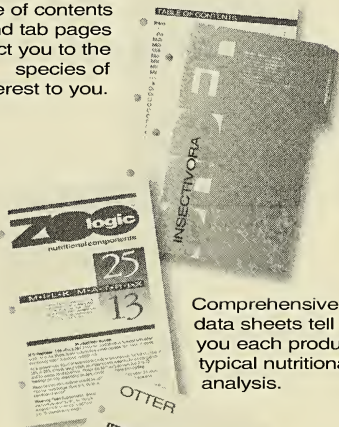


## nutritional components

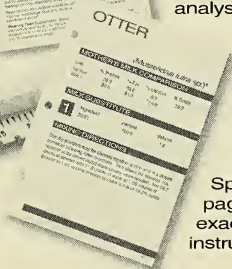
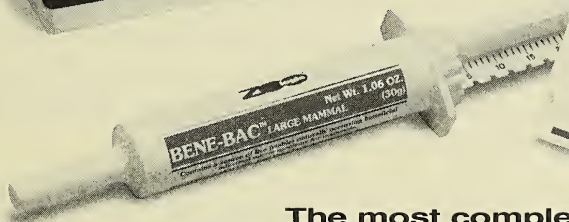
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# ABC's

## ABC's: Animal Behavior Concerns and Solutions

*A Question & Answer Forum for Animal Professionals*

©2003 by Diana Guerrero, Independent Behavior Consultant  
Ark Animals of California, Big Bear Lake, CA



### **Behavior 101: Individuality and Potential**

Is your training prodigy simply a reactive organism or is it an individualized creature with unique potential? Depending on the theory you adhere to, or the experience under your belt, this might stir up some great dialog within your training staff.

Whatever your opinion, aptitude can vary dramatically from individual to individual. Just as some people have a talent for training, there are animals that have a propensity for it and others that do not. Any being can be conditioned or trained, but just how fast and how intricate the process gets will depend on the ability of trainer and the capability of the animal.

Learning rates vary considerably between individual animals and even species. I find that cross comparisons are difficult to reliably measure due to fluctuations between animal species and individual idiosyncrasies. Influences affecting training subjects can include social structures, environmental impact, instinct, evolutionary adaptations, natural behavior repertoires, hormonal patterns, training experiences, personal life histories, learning curves, and other variables.

Although training relies on consistency, clear criteria, and discrimination, it also relies on flexibility and attentiveness of the trainer to the animal and the current environment and related influences. Even though we try and narrow any discrepancies between humans, both humans and animals show preferences and variations in their repertoires. This is what makes training not only a science, but also an art form.

If you ask one trainer how he or she accomplished a specific task with a specific animal it is highly probably that you will get a different answer from another trainer who is asked the same question about the same species but a different individual. Being able to read animal behavior, and using intuition or your gut feeling, is something veteran trainers do well. Experience helps fine-tune your techniques and increases your level of success if you work at it.



Personally, I like to see the individual animal reach its full potential. The most difficult training subjects I have encountered have always been the most sensitive or the most intelligent. However, once redirected these creatures are amazing and talented pupils. You always have to keep working to challenge and manage the animal, but it often remains a spirited subject.

Are there trends? Sometimes. Those animals with consistent training and housing backgrounds appear to be more amiable and apt pupils. However, if an animal is captive-bred and reared in a complex and stimulating environment it may, or may not, have a better aptitude than an animal that is captive-bred and reared in what we consider a sterile environment. I have found quick and willing animal pupils both in sterile environments and in complex stimulating settings.

Another trainer shared that in a complex training task one animal took hundreds of trials to successfully accomplish a matching-to-sample task, while another took thousands. So, the same trainer with two animals of the same species faced significant differences between animals. Identifying the differences between individuals during the training process is something an astute trainer learns to do in order to be successful.

Sometimes there are complex interactions within the animal hierarchy that interfere with cooperative behavior. A perceptive trainer will be able to assess a situation and circumvent a problem, or appraise it in retrospect.

For instance, I witnessed an incident in a dolphin pool that escalated when an assistant trainer failed to take action when directed to do so. It was fortunate that nobody was seriously injured. Upon later review, several training errors were discussed. The incident could have been avoided if the head trainer and assistant anticipated the behavior of the dominant animal and acted accordingly based on their knowledge of the animal and her past behavior. In this case, their lack of attentiveness to detail created a potentially dangerous situation that could have been avoided altogether. The incident was complicated by the inexperience of the assistant trainer, but the ability to later assess the situation and then develop contingency plans made the best out of a nerve-wrecking situation.

All animals have individual potential. The skill lies in “reading” the characteristics of that animal. That ability enables a trainer to know how far to push at any given moment, and to identify when the animal is amiable, or when they are best left out of a training session. How you develop the skill to recognize these signals comes with practice, from watching the animal, and learning the behavioral signals the animal or species gives.

About the columnist: Since 1978 Diana L. Guerrero has worked professionally with both wild and domestic animals. Guerrero has been affiliated with and certified by a variety of animal programs in the USA and Europe. Based in California, she writes, consults, and leads safaris. Information on her animal career programs, training courses, and her newest book, *What Animals Can Teach Us about Spirituality* (SkyLight Paths, 2003) are available through her website. Questions for ABC's should be submitted to Diana directly through the ABC's questionnaire on her website, via email ([zooit@arkanimals.com](mailto:zooit@arkanimals.com)), or through regular mail: c/o ARKANIMALS.COM, PO Box 1989-215, Big Bear Lake, CA 92315 USA.

# Seeking Funding For Labarua School Lunch Program

*By Patty Pearthree*

If anyone has extra funds that they would like to see go to an education/conservation program, this is the perfect project! The Lebarua elementary school is just outside of Lewa Wildlife Conservancy in Kenya.

When I visited Lewa in December, 2002, I discovered that the school kids at Lebarua (one of the five schools Lewa supports) are expected to stay at school all day but the only nourishment they get is milk for lunch and many walk an hour each way to school. We all know how important proper nutrition is for learning so I thought the best thing additional funding could support would be a lunch program.

The Education Officer, Anne Ruhui's suggestion for a meal is maize and beans and she has calculated the cost based on other lunch programs in the area. The cost to feed one child on a meal of maize and beans would be \$5.20 per term and considering Lebarua has a pupil population of 226, this would amount to \$1,175/term. There are three terms in a school year, therefore **to feed the whole school for a year would cost \$3,526!**

Rural farmers in Kenya have suffered as human and wildlife populations have been forced to share increasingly limited land. Crops are regularly damaged by wild animals and predators kill domestic stock which builds up a mistrust and misunderstanding of wildlife. The solution to living in harmony lies in the sustainable use of wildlife with local support and participation. Wildlife must bring tangible benefits to the communities it shares the land with if the people are to view it as an asset rather than a liability. A value must be placed on wildlife and the revenue it earns must radiate outwards to the communities. Lewa aims to improve the education and the educational facilities and encourage the conservation of wildlife.

The only assistance that the Kenyan government, through the Ministry of Education, provides towards Kenya's primary schools is to supply the teachers and pay their wages. Everything else like textbooks, writing materials, desks, blackboards and the buildings themselves have to be supplied by the local community. It is very difficult for parents to fulfill these requirements considering that an average rural Kenyan family consisting of roughly five children earns a wage of \$2/ day on average.

Lewa's aim is to give children on their boundaries access to the best possible education and to create an awareness of the importance of conservation. All of the classes are invited to tour Lewa where most see animals such as rhino and elephant for the first time in their lives. Lewa built five schools in the surrounding area and a trust fund pays the top student from each school each year to continue on to secondary school. A school lunch program is one of the main objectives for all five schools in the coming years.

This is a special project for AAZK that is intended to be in addition to "Bowling For Rhinos" (BFR)



and not meant to take away from the BFR effort. We want to make this project available for those wishing to support conservation through education. If your Chapter (or you as an individual) would like to support the "Adopt-A-School" program, please **make checks payable to: AAZK, Inc.** and mail to:

"Adopt-A-School Program"  
c/o Barbara Manspeaker  
AAZK Administration Office  
3601 SW 29<sup>th</sup> St., Suite 133  
Topeka, KS 66614-2054

## A Letter of Thanks....

*Dear Patty*

*Hope you are well and many regards from Lewa.*

*We received the \$400 from Kevin Shelton towards the Leparna school program - hope you received my thank you letter and receipt.*

*The lunch program started in earnest right after the money came in. The school had about 10 bags of maize in storage so we supplemented these with eight bags of beans and cooking oil so that the students could feed on a diet of "githeri" (fried mixture of maize and beans) everyday. This has been very successful and the pupils are happy and well fed!*

*However, I will continue to keep you updated on the progress of the school and the program.*

*Once again, I would like to thank you so much for all your support and concern.*

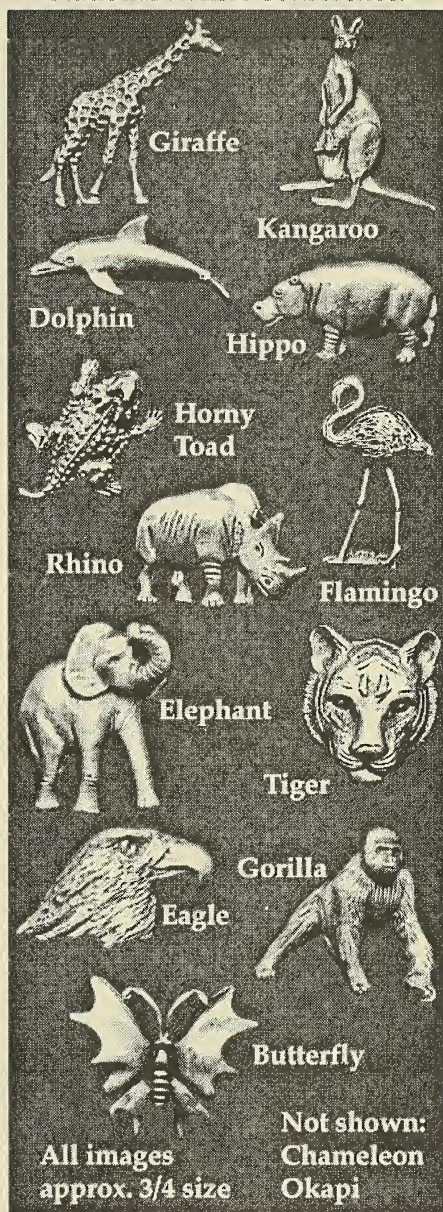
*Best wishes,*

*Anne Ruhin  
Education Officer*

*(Editor's note: The \$400 mentioned in the letter came from donations to the Adopt-A School Program initiated last year by AAZK Executive Director Ed Hansen.)*

## A Pewter Pin Makes a Great Gift

### And the Proceeds Support the 2004 National AAZK Conference.



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# *A Bizzare Monkey Born*

*A report from Kenyan AAZK member Lawrence Ng'ang Ngugi  
Animal Keeper, Mt. Kenya Animal Orphanage, Nanuiki, Kenya*

What would you call a primate born of an olive/Nubian baboon mother and a golden-bellied crested mangabey father? Taxonomically, the two parents share the same family: *Cerpithecidae*. The olive/Nubian baboon belongs to the genus *Papio* and the mangabey belongs to *Cercocebus*. The species names are *Papio anubis* and *Cercocebus galartus chrysogaster* respectively. Definitely the baby has no taxonomic group. We at the world famous Mount Kenya Game Ranch Orphanage have settled on the name "MANGABOON" for one of the only hybrids of its kind ever born.

The golden-bellied crested mangabey at our orphanage is named Gabby. He joined other orphans in 1992 when he was intercepted by C.I.T.E.S officials in the Zurich airport while being smuggled out of Africa and was brought to the animal orphanage. This mangabey is one of the rarest races found in the Congo forest. They are arboreal in habit but sometimes descend to the ground in search of food. They have long limbs and slender bodies but males are relatively robust, quite strong and savage. Like other arboreal dwellers, they are agile leapers.

On the other hand, our orphan (the baboon) is named Tabby. Baboons are generally African in distribution with the *anubis* extending across tropical Africa from Nigeria to the Sudan, Kenya and Tanzania. They are terrestrial in habit but retire up the trees to sleep. Baboons are the largest and most powerful primates after Anthropoids (i.e human like). Tabby was found abandoned and brought to the orphanage from the Laikipia plains in 1997. Being altricial in habit, primates can get stressed in solitude and therefore we always strive to bring up families at the orphanage.

When Tabby came in, she was introduced to Gabby for companionship sake. By and by, they grew intimate with Gabby becoming very protective. They courted, but due to non-compatibility of their anatomy it was difficult for them to mate, but they soon found a way to get round the difficulty. After almost half a decade of trying, they are now blessed with a female infant named Safari. (Born when our directors were out on safari (i.e. journey).

Before the expected birth of the Mangaboon, not one of the orphanage staff had a clue that Tabby was pregnant. After all, the two belong to different genera therefore, nothing was expected to go beyond mating. Two months before parturition, Tabby had an abnormally enlarged abdomen and we thought she could be developing a gastrointestinal malfunction, or had some type of worms. We administered dewormers and kept an eye on her. On the morning of 30 June, 2003, Tabby was unusually lying on the ground instead of her room up in the shelf. We were tempted to administer an antibiotic drug but waited and decided to give it time. An hour later, one of our keepers called to say "Tabby is a mother". Alas, so labor pains had been the trouble! As it is tradition with the orphanage staff, an impromptu naming ceremony was held over cup of tea and hence the names "Mangaboon", and "Safari".

We also have observed tremendous behavioral changes in Gabby since the birth. He lately behaves so much like a father unlike before. He lets the female share in the preferred food type offered like bananas and maize cobs among others. Initially he would keep the female at a distance until he was done with the best part of the food. He is also more aggressive towards visitors; I bet in the name of protection. He occasionally plays with the baby, but Tabby watches very closely and will snatch her away immediately if the baby makes the slightest noise. Safari is healthy, growing and learning the tricks of her kind. I hope she grows up to be a big girl and that there will be more sisters and brothers.





# Book Review

## **The Last Big Cats: An Untamed Spirit**

2003 Text by Erwin A. Bauer, photographs by Erwin and Peggy Bauer

ISBN 0-89658-593-X

Voyageur Press, 123 North Second St, Stillwater MN 55082

Hardcover, 160 pages, 160 color photos, \$29.95

*Review by Christine Clark, Educator  
Connecticut's Beardsley Zoo, Bridgeport, CT*

Erwin Bauer and his wife Peggy were on photo safari in Tanganyika. Bauer spotted a hippo at a watering hole. The tangle of jungle was too thick to get a clear shot of the hippo. Bauer quietly slipped out of his jeep, and silently made his way toward the unsuspecting hippo. About halfway there Bauer got a strange feeling and stopped in his tracks. Ahead, right in his path was an adult lioness. As he resisted the urge to bolt he started to notice several other feline faces staring at him. Not yielding to terror, he carefully backed away to the safety of his jeep, where he sat for a long while. The introduction of *The Last Big Cats* opens with this narrative. The author then goes on to talk about his 50-plus years photographing big cats. He defines "Big Cats", and lists some of the traits and characteristics they share. He gives fossil evidence, historical references and summarizes present day research.

The book is then divided into seven chapters, one on each cat – lions, leopards, cheetahs, tigers, snow leopards, cougars and jaguars. Each chapter includes a silhouette of the animal's front track, a current range map, and of course several photos throughout the text. At the end of each chapter are a series of photos as well.

The text includes many anecdotes of the Bauer's combined 80 years observing and photographing wildlife. The descriptive narrative takes the reader on a journey as the author recalls their adventures. He includes general natural history information – range, wild diet, special hunting techniques, and reproductive information. Bauer also writes about human/cat conflicts including human encroachment of cats' habitat and tales of man-eaters. Each chapter closes with a look at the cat's status in the wild and the pressures, both past and present, on their population numbers.

Bauer has made some interesting observations during his many years studying cats. He also cites information by long-time researchers George Schaller, Alan Rabinowitz and Mel Sunquist. Some of the more interesting observations made were; a tiger sharing his kill with two females and four cubs, evidence of leopards thriving on the fringes and slums of cities in Africa by living on rats, house cats, stray dogs and even human derelicts, and that female cheetahs (who don't defend territories) travel over 600 square miles to find prey and avoid other females.

This book is easy, quick, interesting reading without much hard science included. It is truly a coffee table book with as many pages of text as photos. Bauer admits in the introduction that photos of cheetahs, jaguars and snow leopards are taken in breeding facilities. However, no reference list of photos is given so one wonders where and under what circumstances some of the photos were taken. A few of the cats look captive fat (or they possibly just engorged in a big lunch) and some backgrounds don't look quite real. Bauer includes great prey photos and landscape photos of habitat, some of which are breathtaking. If you are looking for a reference book on big cats you won't find it here. If what you want is a book with interesting and descriptive tales of a photographer's years studying big cats with plenty of pictures, this is it.

## Aquarium Plants

By Christel Kasselmann

English Edition 2003

ISBN 1-57524-091-2

Kreiger Publishing, P.O. Box 9542, Melbourne, FL 32902-9542

518 pgs. Hardback \$84.50

*Review by Dan Conklin, Aquarist  
The Florida Aquarium, Tampa, FL*

This book is a hardback English translation of the German author Christel Kasselmann. She is an experienced author of aquatic plant literature and has put together a comprehensive reference for the amateur aquatic plant enthusiast and the professional botanist. If growing aquatic plants is one's goal, this book may prove to be just what is needed for success and is the most useful aquarium plant book I have read. The author has collected data from her extensive field experience and identified the environmental conditions aquatic plants inhabit. Scientific information concerning reproduction, flower biology, morphology, and reference literature is also included.

The first 17% of the book discusses various habitats, lighting, propagation, flowers, and selection of aquarium plants. The remainder of the book treats each of over 300 species individually with synonymous names, distribution, description, aquarium growth conditions, and at least one photograph. The pleasant consistency and organization of this process makes it very readable and easy to find information for a specific species. A part of this format contains botanical jargon to describe morphology. However the glossary is adequate for assistance if needed. A most useful aspect of this work is that truly aquatic species are differentiated from emergent species. This is very important since this may be the most overlooked criterion when it comes to keeping aquatic plants. Many plants are only temporary in submerged growth form and this of course explains why a particular species does not do well in the long run when kept underwater. An Appendix gives helpful data on temperature ranges and optimums, leaf morphology, and common names for 48 species. Part of the Appendix is dedicated to lighting preferences by indicating relative strength of light

I highly recommend this book for anyone interested in aquatic plants, particularly in an aquarium context.

## MOVING?

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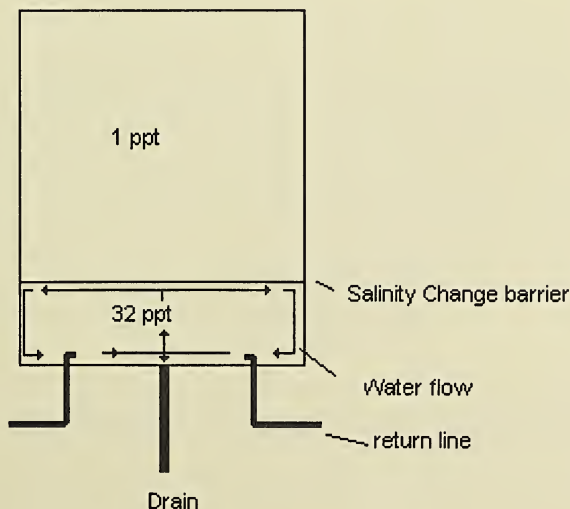
# The Water Column

By

*Dan Conklin, Senior Biologist, Florida Aquarium  
Bruce Elkins, Curator of Waters, Indianapolis Zoo  
Kevin Shelton, Associate Curator, Florida Aquarium*

## Sampling Methods

This month I want to discuss methods for collecting water samples from your tanks. Now for most small systems this will not be of major importance since the water will be pretty homogenous over the entirety of the system. One reason is the small volume of water in the system, another is that turnover is generally high, so mixing is generally well accomplished. But for larger systems, where and when you collect a water sample for testing can make a large difference in the measurement you get. Example: We had a 1000-gallon jellies exhibit that fed water from the filter sump to the tank from the bottom and returned it from the bottom. While this sounds silly, the return jets sprayed across the intake and kept the jellies from becoming stuck to the intake. The tank was initially filled with freshwater to rinse it and then salt was added to the sump to bring the salinity up to 32 parts per thousand. We took water samples from the sump to test the salinity on a daily basis for about a week. After that week we noticed what appeared to be a thermal layering in the tank. We then tested the water directly from the tank and found it was a salinity barrier and not a thermal one. The top three quarters of the tank had not mixed at all. Salinity at the top was one part per thousand and the bottom quarter was at 32 parts per thousand.



Luckily, we were a good two months from using the tank. The change in salinity was enough to cause a barrier to further mixing given the filter set up on the exhibit. This example is an extreme one but does illustrate the need to sample water from various areas of the system. So how do you go about it?

First, most people will take a water sample from the easiest place to reach the water, such as we did with the jellies tank by taking water from the sump. While a standard place to take water sample is ok on a normal basis, don't become complacent! Work it into your routine to collect from different spots. One of the things we have even done is to collect samples while diving an exhibit. (Ok, the exhibit needs to be big enough to dive...) Simply take a closed sample bottle with you and open it in the desired location for the sample. Make sure to close it tightly before moving again. Some institutions have even used devices made to deep water sampling, very expensive, but illustrates my point.

Don't forget about other parts of the filter system as well. Samples should be taken periodically from the sump, biofilter, protein skimmer, or sand filters if you have the ability. Another example, a large institution (and I'm not naming names) was having trouble getting the biological filtration stabilized on their exhibit. The system consisted of a tank, protein skimmer, bio filter, rapid sand filter, and ozone treatment injected into the return line of the tank. They suspected the ozone of causing problems but could never get ozone readings from the exhibit. Yet every time the ozone was turned off the ammonia load started to decrease over time, and then would spike again when the ozone was turned back on. Finally they took samples from the biofilter and found that while the ozone was not reaching the exhibit it was reaching the bio filter and slowing down the bacterial growth there.

So to summarize, make sure to spread your water sampling around the system. We tend to think that all the water in a system is the same but there are many ways it can become separated even with strong filtration.

A quick reminder: The authors of the Water Column are always willing to answer any questions you might have. They can be about filtration systems, water chemistry, or aquatic life. If we don't know, we will find out for you! We also welcome feedback from readers about previously published columns. Questions and comments may be submitted to us by email at:

Dan: [dconklin@flaquarium.org/](mailto:dconklin@flaquarium.org/)

Kevin: [kshelton@flaquarium.org/](mailto:kshelton@flaquarium.org/)

Bruce: [belkins@indy zoo.com/](mailto:belkins@indy zoo.com/)

Or by mail at: Kevin Shelton, The Florida Aquarium, 701 Channelside Drive, Tampa, FL 33602.



# Notes on Poison Dart Frog Breeding at the Little Rock Zoo

By Jeffrey S. Pfeiffer, M.S., Amphibian & Reptile Keeper  
Little Rock Zoo, Little Rock, AR

## Introduction

Poison dart frogs (genus *Dendrobates*) are tiny, tropical and subtropical anurans found primarily in Central and South American rainforest areas. Dendrobatids are among the smallest of frogs, many species having a maximum adult size of 2.5 cm (one inch) or less. They are also among the most colorful, many species being adorned in bright greens, yellows, blues, reds, or combinations of different colors. This garish appearance serves as a warning flag to potential predators that many of these frogs possess some of nature's most potent toxins in the secretions of glands in their skin. In fact, the inhabitants of the rainforest areas where these frogs occur rub the tips of their blow darts on the bodies of these frogs to make them into lethal weapons (hence the name "Poison Dart Frog").

There are several dozen species of poison dart frog that are commonly found in zoos and private collections. Some are fairly large (for dart frogs) and therefore tend to be better animals for exhibit viewing than the (many) really tiny ones. The Little Rock Zoo currently houses four species of Dendrobatids: the green-and-black poison dart frog (*Dendrobates auratus*), the blue poison dart frog (*D. azureus*), the yellow-and-black poison dart frog (*D. leucomelas*), and the dyeing poison dart frog (*D. tinctorius*). These four species were chosen for their relatively large size (up to 5 cm in length/1.97 in.), bright colors, ease of maintenance, and exhibit potential. The green-and-black poison dart frog is bright green or olive in color, with numerous black blotches and cross bands. The blue poison dart frog, as the name suggests, is blue in color. The back of the frog is usually patterned with numerous dark spots. This frog is rigidly protected in the wild, and captive breeding by zoos is strongly encouraged. The yellow-and-black poison dart frog is very similar to the green-and-black, with yellow replacing the green color. The dyeing poison dart frog is one of the most beautiful of the dart frogs, being a bright blue in overall ground color, with dark legs, and a yellow or white netlike pattern on the back. The blue and the dyeing poison dart frogs are among the larger dart frog species, reaching the 5 cm length mentioned above; the other two species are slightly smaller, averaging 3 cm (1.18 in.) in length.

Because of their small size, and the fact that they are animals of the humid rainforests, they require special care and exhibit setup. The exhibit should be liberally planted with live mosses, bromeliads, ferns, orchids, and other tropical plants. Only the tiniest of food can be eaten; the diet of the frogs at the Little Rock Zoo consists primarily of flightless fruit flies (*Drosophila hydei*) and pinhead (week-old) crickets. Termites are also provided when available. The feeder insects are dusted with a good multivitamin powder before being offered to the frogs. Like most other amphibians, dart frogs must lay their eggs in very damp areas, and the tadpoles that hatch must be able to find a water source in which to grow and develop. In nature, the frogs usually lay their eggs in a jelly-like mass on a leaf overhanging a small body of water. Once the tadpoles hatch, they slide their way into the water, where they remain as tadpoles for several months. Once they begin to lose their tails and sprout legs, they emerge from the water and begin their life on land.

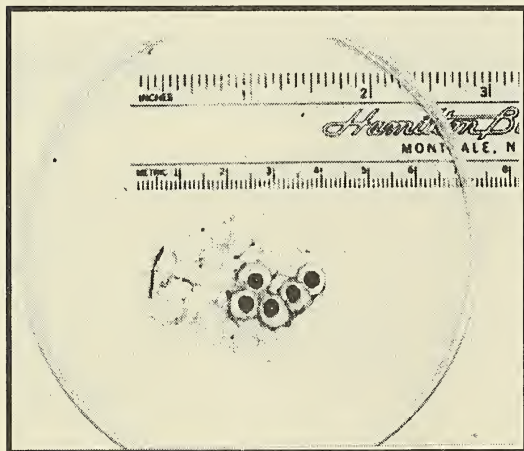
In captive situations, however, special modifications must be made. The Little Rock Zoo has been breeding dart frogs since early January 2001. This manuscript will describe the methods and results of the breeding program at the Little Rock Zoo for the four species described above. It should be noted that the procedures used here at our zoo may or may not be the same as those used at other institutions; the following is the program that was established at our zoo and what worked for us.

## Methods

Breeding groups were established for each species, which generally consisted of two to three females and three to four males. Adult males can usually be distinguished from females by the presence of enlarged toe tips on the male's front legs. Males generally have a sleeker, less "round" appearance than the females, and male frogs can often be seen "calling" to attract potential mates and to establish territories (female frogs do not call). The adult frogs were provided with a "breeding hut", an inverted half-coconut shell with a doorway cut into the bottom. This hut was placed over a small glass dish such as a Petri® dish. Generally, once the females are ready to lay their eggs, they will enter the hut and deposit their eggs in a cluster on the dish. The egg mass will contain anywhere from two to ten eggs. The male then moves over the eggs and fertilizes them, covering them with sperm. Once fertilization had taken place, the dish was then removed and placed into a plastic container (clear "shoe box") with a small amount of water on the bottom to keep the humidity up. The container was then covered with a lid and the date recorded. Another breeding hut was placed into the exhibit with the adults, as each female may produce as many as 12 clutches of eggs per season.

Freshly laid eggs are clear and round, and surrounded by a jelly-like matrix. Each egg will have a tiny black dot in the center; this is the developing embryo. Embryos that are healthy will start to

grow and become elongated a few days after the egg is laid. Non-viable eggs will have a yellowish or cloudy appearance, and no growth or change will be seen. After about two-and-a-half weeks, tiny tadpoles can be seen wiggling inside the eggs. The tadpoles emerge from the eggs a few days later. Occasionally the tadpoles will have trouble breaking free of the jelly-like matrix and must be manually removed from the mass. This is accomplished by separating the target tadpole from the mass with a new, clean razor blade and carefully slicing away the jelly matrix. A small opening in the matrix must be made that will allow the tadpole to escape. A gentle stream of de-chlorinated water trickled over

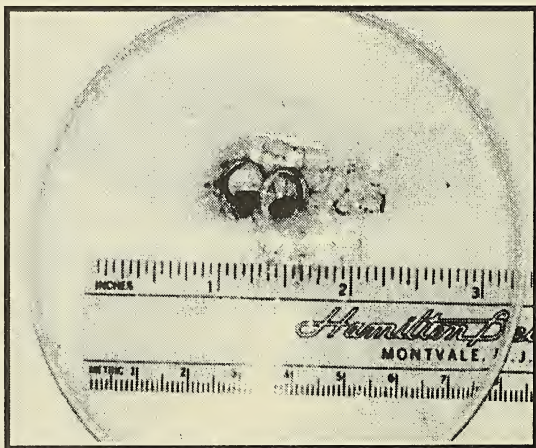


**Green and black poison dart frog eggs - 1 day old.** Photo: Daphne Brock

the egg will aid in the escape process. Extreme care must be taken not to cut or damage the tadpole in any way. An injured tadpole will die. It is also very important that the tadpole is freed of all traces of the jelly residue. If any remains on the tadpole it will not survive.

Once freed, the tadpoles were housed in individual containers of water; small clear plastic disposable drinking cups were used for this purpose. Each cup contained approximately 100 ml (3.4 fluid ounces) of water. We used aged, carbon-filtered water that had been treated with Tetra® Blackwater

Extract (one ml per gallon) to maintain a slightly acidic pH. The water was kept at a temperature ranging from 23° C to 26° C (74°-79° degrees F.). The tadpoles were fed a small amount (a "pinch") of plant-based flake fish food



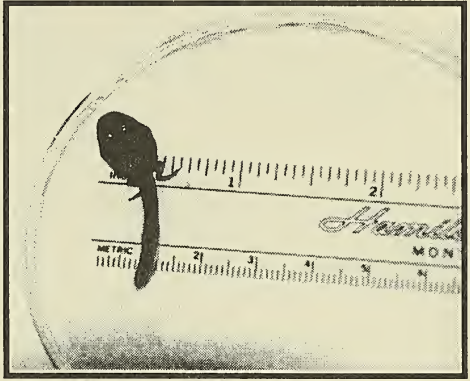
**Green and black poison dart frog eggs- 17 days old.** Photo: Daphne Brock



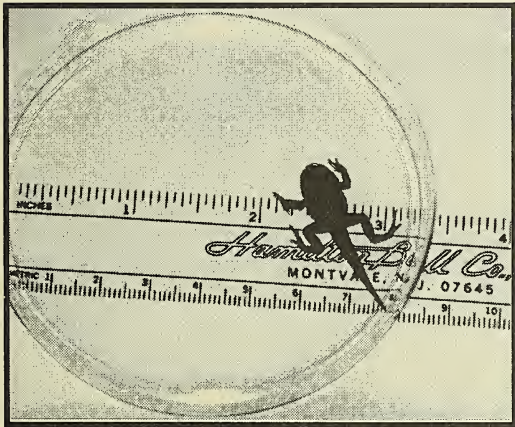
(*Spirulina*) daily. Several hours after each feeding, the water in the container was changed. Generally, growth is quite rapid, and within two to two-and-a-half months tiny rear legs can be seen sprouting from just in front of the tail. Within the next two weeks the front legs start to emerge, and the tail begins to noticeably decrease in size. At this time the tadpoles, which have been black in color up to this point, begin to assume the colors and patterns of the adults. A week or so later and the tail has disappeared entirely, the legs are strong and well-developed, and the little froglet is ready to be moved into its permanent enclosure. The frogs will mature in about 18 months.



**Green and black poison dart frog tadpole**  
10 days after hatching. Photo: Daphne Brock



**Green and black poison dart frog tadpole**  
63 days after hatching. Photo: Karen Caster



**Green and black poison dart frog tadpole**  
74 days after hatching. Photo: Karen Caster



**Green and black poison dart frog tadpole**  
80 days after hatching. Photo: Karen Caster

During the first year of our breeding program (2001), we concentrated on breeding only the blue poison dart frogs (breeding group: 4.2 [male-to-female ratio]) and the green-and-black poison dart frogs (breeding group: 5.2). As all frogs in each group were housed together, the results present total numbers of frogs born to each breeding group, without taking into account the individual fecundity of each particular mother. In the second year of the program (2002) we added the dyeing poison dart frog (3.2) and the yellow-and-black poison dart frog (2.1) to our program. Observations were made as to the numbers of clutches laid by the females in each group, the total numbers of eggs laid, and the numbers of tadpoles that successfully reached maturity. In addition, it was noted the length of time it took for each frog species to make the successful transition from hatchling, through metamorphosis, and into adult.

## Results and Discussion

In 2001, we had our greatest success (in respect to actual numbers of offspring produced) with the blue dart frogs. Much less success was achieved with the green-and-black dart frogs. The results of our first year of breeding with these two frog species are shown in Table 1.

**Table 1.** Breeding results for Blue and for Green-and-Black Dart Frogs (2001)

Frog species	Total # clutches produced	Total # eggs laid	Total # eggs hatched	Total # tadpoles survived to adulthood	Survivorship of tadpoles hatched	Avg. time to complete metamorphosis (days)
Blue	17	88	29	13	49%	73
Green-and-Black	7	24	6	1	17%	63

In 2002, the dyeing and the yellow-and-black dart frogs were added to our program. The blue dart frogs produced fewer clutches than the previous year, while the green-and-black dart frogs gave results similar to those achieved in 2001. The dyeing dart frogs achieved the highest success rate of all the frog species tested in regard to numbers of eggs produced and offspring that reached adulthood. The yellow-and-black dart frogs yielded fewer clutches, but had a higher rate of hatchlings surviving metamorphosis. The results of our second year of breeding for all four frog species are shown in Table 2.

**Table 2.** Breeding results for Blue, Green-and-Black, Dyeing, and Yellow-and-Black Dart Frogs (2002)

Frog species	Total # clutches produced	Total # eggs laid	Total # eggs hatched	Total # tadpoles survived to adulthood	Survivorship of tadpoles hatched	Avg. time to complete metamorphosis (days)
Blue	5	19	14	8	57%	83
Green-and-Black	3	9	4	1	25%	66
Dyeing	5	37	15	12	80%	79
Yellow-and-Black	1	7	6	6	100%	67

As shown in the preceding tables, the blue dart frogs seemed to maintain a fairly constant rate of success as to the percentage of young that survived to adulthood. While the actual numbers of clutches decreased in 2002, the survivorship of tadpoles into adults remained fairly consistent. The tadpoles of the blue dart frogs also seemed to have a longer development period than the other frogs, remaining in the tadpole stage up to two weeks longer than the other species. The green-and-black dart frogs did not produce an appreciable number of clutches in either year. The dyeing dart frogs, while producing the same number of clutches as the blue dart frogs, deposited a far larger total number of eggs; furthermore, they also had a much higher rate of survivorship than the blue dart frogs. The yellow-and-black dart frogs only produced one clutch; however, all of the offspring hatched survived to adulthood.

The results obtained in our breeding program were hindered by several important factors. Foremost, our sample size was very small for each species; larger breeding groups would probably show a much wider variation in success rates. Also, a more lengthy study could be undertaken, extending several seasons to see if any patterns presented themselves. All of the frogs used in the program were obtained as adults, and information on the ages of the frogs was often lacking. Therefore, any patterns relating to the ages of the breeding adults were not able to be determined. Generally, adults have an optimum age for greatest breeding success, and accurate information on the ages of the breeding adults would be very helpful in a study such as this one.

As the frogs born here at the zoo develop and become sexually mature, many more combinations of breeding groups can be established with frogs acquired from other institutions. It is hoped that the eventual result will be breeding groups of known ages and of significant numbers to provide more meaningful data as we continue the dart frog breeding program at the Little Rock Zoo.



## CMCZ AAZK Chapter

The employees of The Cape May County Park and Zoo are proud to announce the official designation of their own local Chapter of the American Association of Zoo Keepers. News of the approval by AAZK's Board of Directors came in June of this year.

Founding members have appointed officers:

President..... Sheri Hickok

Vice President..... Jessica Schera

Treasurer..... Jim Quirk

Secretary..... Tracey Carr



One conservation effort the Chapter has adopted is the Mountain Bongo Repatriation Project under the guidance of the Bongo Species Survival Plan and the Rare Species Conservatory Foundation. The Chapter would like to raise money to help support the foundation that sent the Zoo's youngest female bongo, Mara, to the breeding sanctuary in Kenya for participation in a program in which her offspring will be reintroduced to Mount Kenya.

The Chapter's first fundraising event was an employee barbecue held in June, which brought in almost \$500.00 in proceeds. Plans are underway for additional activities including a Beef and Beer benefit in the winter, which will be open to the public.

--Jessica Schera, Vice President

# Chapter News Notes

## The Philadelphia AAZK Chapter

The Philadelphia Chapter hosted its second most successful Bowling for Rhinos fundraiser in June. We raised over \$7400 this year to support the national effort. Thank you to our committee chair Betsy Karkowski and the rest of the Bowling for Rhinos Committee for all their hard work! In addition, we now have a donation box with a graphic describing this unique fundraiser in front of our new white rhino exhibit, which raises an additional \$50-\$100 each week and spreads the word about rhino conservation.

The Philadelphia Zoo hosted a free-flight bird show this summer, brought to us by Natural Encounters, Inc. The Philadelphia Chapter of AAZK would like to thank the NEI staff for all their support this summer, from coming to all our social events (including BFR!) to helping us with our Keeper Evening program. We appreciate all of their help!

--Catherine Vine, AAZK Liaison

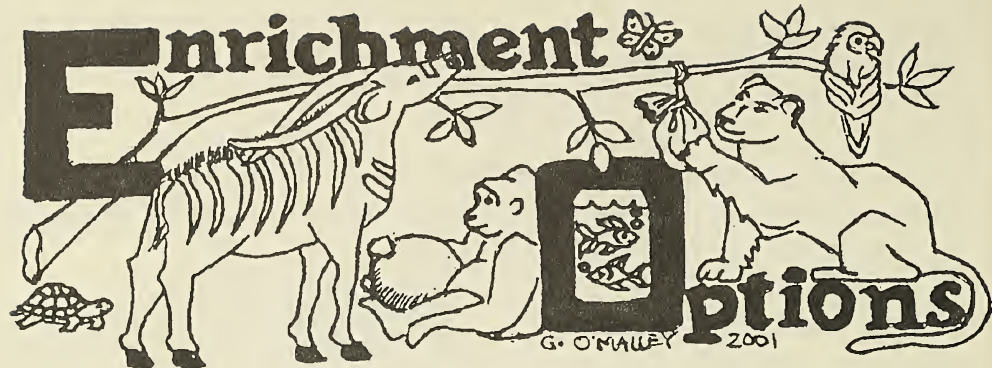


A M E R I C A N  
A S S O C I A T I O N  
O F Z O O K E E P E R S  
PHILADELPHIA CHAPTER

## Dallas Zoo AAZK Chapter

The Dallas Zoo had another good BFR turn out. We tried a new event this year along with Bowling for Rhinos, we had Sailing for Rhinos. We raised \$10,438.97. Alex Vasquez was the top money raiser for the second year in a row. Once again everyone had a great time.

--Kim Beldin, Dallas AAZK Liaison



EO Editors - Dawn Neptune, Utah's Hogle Zoo  
and Rachel Cantrell, Disney's Animal Kingdom

## Can primates receive adequate primary diet from an enrichment unit?

By Sarah Jane G. Webster, University of New Hampshire  
Durham, New Hampshire

Primate survival is increasingly dependent on human support as various species become endangered and due to the rising number in captivity. Primate caretakers are also aware of the demand to provide a natural lifestyle for primates in captivity. The living accommodations and enrichment tools are a vital role in a primate's life under human care. Animals in captivity have a strong need for enrichment opportunities. They need mental and physical stimuli as much as any animal in the wild. Primates are of particular interest because of their close connection to human existence. Foraging is a natural process for most primates that contributes to their mental and emotional well-being. In research done at York's Wild Kingdom in York, ME. efforts were made to provide an enrichment opportunity for the primates in captivity using specially designed units described below.

*Cebus Capucinus*, more commonly known as Capuchins, are of the family Cebidae and can either be found in wet lowland forests or dry deciduous forests. Capuchins usually weigh between 4.4-6.6kg (9.7 to 14.5lbs). All Cebidae are omnivorous with diets consisting of fruits, insects, seeds, flowers, and occasional small vertebrae. Like most new world primates in the wild, a good portion of the day is spent foraging. Whether they are foraging in secondary growth, mature forests, or mangrove forests, they will break open seeds and nuts over rocks; consume the ripest fruit by biting, squeezing, and smelling for ripeness.

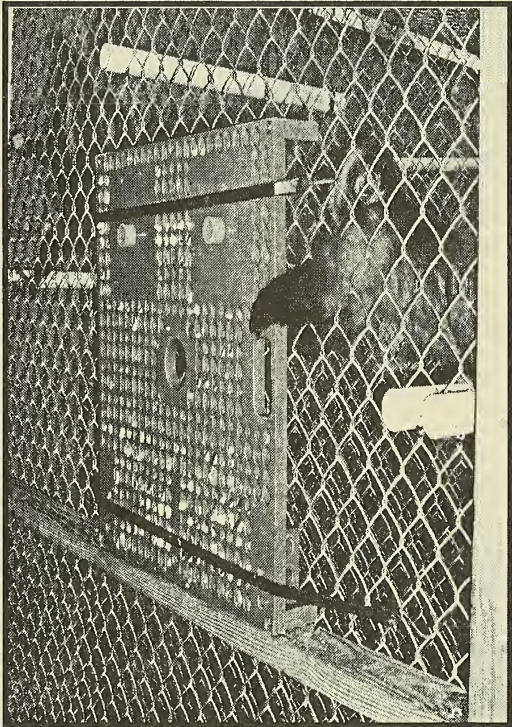
These nomadic primates occupy areas of that vary considerably in size. Some reports give an account of home ranges varying from 1/sq km to 111/sq km (.4 to 42.9 sq. mi.). These groups do not typically tolerate different groups of the same species well, being very territorial. However, different groups' ranges often overlap by about 40% and the groups do forage well alongside each other. (Nowak, 1999)

The zoo habitat is designed to be practical for both the animals and zookeepers. The captive enclosures have the necessities of the wild, yet the ease and comfort that the zoo provides. Yet there are obvious limitations to zoo habitats, such as the enclosure of 300 square meters in comparison to the size of their natural habitat. On a typical given day, the capuchins can be found swinging, jumping, etc. around the enclosure or sitting on perches and ledges. If no stimulus is provided all is either quiet or there is mischief to be had.



The capuchins are normally fed out of buckets hung on the outside of the enclosure. The buckets are left up over night and taken down the next morning. The zookeepers in care of the primates report that the capuchins normally eat about 80% of their primary diet given to them directly from the standard feeding bucket. The remainder is either spilled on the ground for later consumption or wasted. Given that about 20% of the diet is potentially wasted when feeding from a bucket, capuchins can do no worse and can only benefit from the mental and physical stimuli of the foraging unit. This keeps the monkeys busy for the allotted time that the unit is available, without hindering their dietary consumption. The capuchins will forage off of the ground for any food that has been dropped or left over and are busy with this task for much of the remaining daylight hours. Foraging subsides at dusk and then begins as the morning dawns. When the capuchins are given their diet in the normal daily feeding bucket, they are less busy and less stimulated than in their own habitat, resulting in diminished mental activity. The capuchins benefit, both mentally and physically, from the use of a foraging unit for their feeding.

Capuchins as well as other primates in captivity tend to lose their natural foraging habits. They lack the opportunity to forage because it is much more convenient for caretakers to feed in buckets. A foraging unit is a human-made device that requires physical and mental effort on the part of the forager. The unit itself is 60.96 centimeters wide and 66.04 centimeters tall, with a depth of 10.16 centimeters (24" w x 26" t x 4" d). There are 224 cavities on the back of the unit, two circles of 35 cavities each covered by two rotating discs, 60 cavities on the top and bottom ledges, along with two sleeves with 50 hidden cavities. The unit is entirely polypropylene plastic for its durability and weighs about 14.0616 kg (31 lbs.). The capuchins need to align the holes in the rotating disks with the cavities containing the food in order to be fed. For monkeys that are unfamiliar with the units, it can take a few hours or a few days if the introduction of the unit is handled properly. Some primates, as demonstrated by a particular male macaque (*Macaca sp.*), are so intelligent that they realize that in captivity they will receive their diet at a particular time and thus are too lazy to forage through the use of a foraging unit.



Given a foraging unit, a capuchin will utilize it to the best of its ability. Can a primate receive its entire primary diet from a foraging unit, benefiting the primate both mentally and physically? Two capuchins at York's Wild Kingdom were given (the Macaca 2008) foraging unit twice a week for approximately ten weeks. The primary diet was cut up and placed in the units' 430 cavities, made available to the monkeys for two and two and half hours. Both capuchins worked diligently at the unit, removing pieces of food with all their fingers and thumbs, holding on to the side of the cage with feet and/or tail, until a sufficient amount of the diet was eaten or on the ground, where it would then be eaten. After the time allotted was up, the pieces of food were counted and the percentage was calculated to find the proportion of the primary diet the capuchins would receive from the unit. On average the capuchins consumed 81.6% of their primary diet given from the unit, taking more time and effort foraging to receive their diet. The excess food left in the unit was then made available to the primates to ensure the entire diet was available. The highest percent attained from the unit

was 90.3% and the lowest was 76.25%. The less frequently the unit was used for feeding, the lower the percent of the diet was obtained. The lowest percent attained from the foraging unit was after not receiving the unit for an entire seven days

There are fewer leftover pieces of the primary diet when the diet is consumed through use of the foraging unit. This may be due to the size that the fruit and vegetables are cut into, leaving less waste than the larger pieces consumed out of the feeding buckets. The units are a bit more time consuming for the caretakers to fill and clean, but well worth the extra effort. It is a better alternative to hiding the diet in the enclosed cage (another foraging technique), as this would be unsanitary. On average it would take about 27.49 minutes to fill the capuchins unit. Yet, over time it became easier and more efficient to fill. At the beginning of the research, it would take anywhere from 32.25 minutes to 45 minutes to fill the unit. Over the ten weeks test period, it has become easier, filling the unit as fast as 21.09 and 19.36 minutes.

The capuchins receive slightly over 81.6% of their primary diet from this unit. While there is only a slight benefit to feeding the capuchins out of an enrichment unit in terms of the efficiency of feeding, the other benefits are numerous. These benefits include extra mental and physical stimulation and close approximations to wild behavior. It is my assumption that any other species would also benefit from receiving their diet from an enrichment unit. These foraging units provide an excellent opportunity to stimulate and observe foraging behavior of the capuchins and other primate species.

### Reference

Nowak, R.M. (1999). Walker's Primates of the World. Baltimore & London:  
The John Hopkins University Press.

### Acknowledgements

I thank Fauna-Tek of New England Exotics Inc and York's Wild Kingdom of York, ME for making this research possible, [www.fauna-tek.com](http://www.fauna-tek.com).

## And Looking Towards the Season of Holiday Leftovers...

With the end of Christmas come a great opportunity to provide enrichment for many of the animals. Christmas trees (not pine) free of any debris and that were not sprayed with any chemicals provide a great, cheap and easy enrichment for many of the zoo animals. Not only do the animals love the often once-a-year treat, but the public loves watching them play with and eat the trees. In my area we gave the elephants, rhino, maned wolves and bison trees. All of them enjoyed them but the strongest reaction besides just eating the tree (elephants) came from the bison. They were all fighting over who got to scratch their backs with it next. We simply tied a rope around the base of the tree, threw it over a tree branch in the yard so it was hanging upside down and let them play. It took all of 10 minutes. Even easier yet, just set the tree in the exhibits and place food items in it.

*submitted by Erin Dowgwillo, Elephant Keeper  
Birmingham Zoo, Inc., Birmingham, AL*

*(Ideas appearing in this column have not necessarily been tested by the editors for safety considerations. Always think ahead and use good judgement when trying new ideas. You are invited to submit materials for the Enrichment Options Column. This might include recipes, toys, puzzle feeders, olfactory enrichment ideas, etc. Drawings and photos of enrichment are encouraged. Send to: AKF/Enrichment, 3601 S.W. 29th St., Suite 133, Topeka, KS 66614-2054. Eds.)*



# Treatment of Bronchitis in a Giant Panda

By

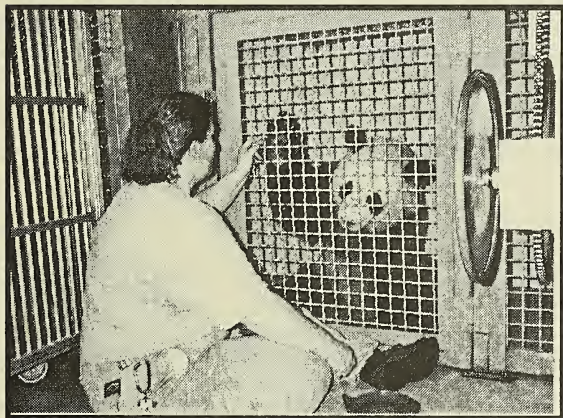
Wendy Gardner, Giant Panda Keeper

Zoo Atlanta, Atlanta, GA

One of the greatest challenges facing zookeepers is medicating their animals. Veterinarians work closely with keepers to choose the most effective, yet least offensive tasting course of treatment. Keepers use creativity to find foods to “hide” or mask oral medications plus many institutions also incorporate animal training to teach animals to accept being hand injected.

Pandas (*Ailuropoda melanoleuca*), especially the two in Atlanta, are neophobic, meaning they are afraid of new food items. For the past 1 1/2 years, we have been limited in what “treats” we can feed simply because the pandas refuse to try new items or spit out the items we offer. The list of items we have tried in the past includes apples, applesauce, and baby foods of various flavors, bananas, cereal, peanut butter, honey, grapes, pears and various other fruits. This is by no means an exhaustive list, but it gives an idea of how many items we have tried. To date (2001), the only food items regularly accepted by our pandas are Marion® Leafateer Biscuits in crushed or whole form and apples. Oral medications are difficult to deliver given our limited choice of vectors. Almost all the oral meds we have given to the pandas have been mixed with a quantity of crushed leafateer biscuits and water and then the mixture is molded into “biscuit balls”.

Zoo Atlanta’s Giant Panda department faced the challenge of getting oral medications to Yang Yang, our male giant panda when he began showing signs of bronchitis. The first signs the keepers noticed were bouts of coughing, irregular posturing, and irregular breathing patterns. Amount of time spent resting increased while respiration rates decreased to eight breaths per minute (bpm). He was separated from the female, Lun Lun and was watched very closely. Keepers and vet staff observed Yang Yang for three days noting that his vocalizations sounded different than normal and he had an increase in water consumption. His activity level was very low and he appeared disoriented. On the fourth day,

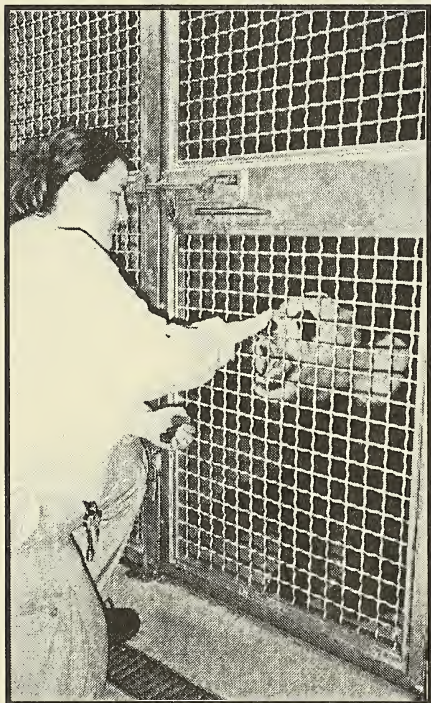


The author with 01. Giant Panda Lun Lun

he was immobilized for his yearly physical examination. During the physical examination, chest radiographs were taken, ultrasound was done on his heart, abdomen and testicles, and a tracheal wash was used to collect fluid from the lungs for culturing. As usual, blood samples were also taken. The next day, keepers noticed that the cough had become more productive and water consumption had again increased. Respiration rates were irregular and varied from eight bpm to 44 bpm. Fecal consistency remained constant during this period.

On the sixth day after keepers first noticed signs, a course of antibiotics was started. Keepers crushed Erythromycin® tablets and mixed them with crushed leafateer biscuits. He received partial doses on two consecutive days before becoming suspicious of all offered foods, even those without medications in them, and refused to eat any. Next we tried Biaxin®, a suspension antibiotic. He did accept a small amount, but refused all other attempts keepers made to administer this medication. Our management team decided to switch to an injectable antibiotic. We used a long lasting antibiotic

called LA-200 (oxytetracycline). The injection caused myalgia (soreness) at the injection site significant enough to cause stiffness and decreased mobility. After sleeping much of the next day, Yang Yang was given a dose of Banamine<sup>®</sup> for pain. We decided that the reaction to the injection was undesirable enough to switch back to an oral antibiotic. Culture results were returned showing significant growth of *bordatella bronchiseptica*. Based on sensitivities of these bacteria, oral oxytetracycline was chosen as the next antibiotic to try. Oxytetracycline<sup>®</sup> is a bitter tablet that is quite large and we had to try and give him 18 tablets a day. A pharmacy was asked to make an apple flavored powder form of the oxytetracycline since the pandas eat apples. In the meantime, keepers offered three oxytetracycline pills crushed in 100g of crushed leafeater biscuits, six times a day. To our surprise, Yang Yang accepted all treatments and the apple-flavored powder was unnecessary.



The author with 1.0 Giant Panda Yang Yang

In addition to administering the pills, we were asked to “nebulize” him with an Amikacin/Saline solution twice a day. Nebulization is a process by which a liquid is forced into the vapor stage so the animal can breathe the vapor, inhaling the medication directly into the lungs. Different mixtures nebulize at different rates. Our 2.2ml Amikacin<sup>®</sup> with 0.8ml Saline solution nebulized completely in approximately 30 minutes. This meant that keepers needed to keep the panda’s face in front of the vapor tube and the vapor stream entering the nostrils the full half hour. Lun Lun, our female giant panda, was also trained for this using a 100% saline solution. Within a few days the medication from the oral drugs and the nebulization process appeared to be working and approximately four weeks after the first signs of bronchitis were noted, the panda management team felt Yang Yang was well enough to discontinue all forms of treatment. We had been able to deliver full doses of medication twice daily for approximately 30 minutes each session without incident for over two weeks. We fed only apple pieces and leafeater biscuit for reinforcement during these sessions. We observed no aggression during the sessions and we kept Yang Yang’s attention during the entire session. Following this he and Lun Lun were then allowed to be together.

After only a couple weeks of treatment Yang Yang started eating more and became more active, within a couple of months he was back to “normal” - no coughing/wheezing, normal respiration and vocalizations, and he was back to eating the same amounts of bamboo and biscuits that he did before he got sick. His activity level had returned to normal, as well as his water consumption.

Yang Yang and Lun Lun have been in a positive reinforcement-training program since shortly after their arrival in Atlanta. Keepers train behaviors that make animal management and husbandry easier. For example, both pandas are “shift trained” to move from one enclosure to another on command and to give body parts for examination. We believe that training has enabled us to successfully administer medication to Yang Yang both orally and with the nebulization process.

**Post Script:** Since writing this paper the pandas have started to eat more food items including bananas, plums, sweet potatoes (male only), and pears.

#### Acknowledgements

I’d like to thank: the panda keeper staff (Penny Cooper, Maia Ekstrom, Rebecca Singer and Sprina Liu) for all of the time spent on getting Yang Yang well; Dr. McManamon for help in editing this paper; and Megan Wilson for all of your support and comments.



# Legislative Update

Compiled by Georgann Johnston  
Legislative Advisor  
Sacramento, CA



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## **New Hunting and Fishing Programs on National Wildlife Refuges**

The U.S. Fish and Wildlife Service (USFWS) has proposed opening new hunting and fishing programs on seven national wildlife refuges in Louisiana, Minnesota, Iowa, Mississippi, Nebraska, Oregon and Virginia as part of its annual Refuge-Specific Hunting and Sport Fishing Regulations. The Service also proposed increased opportunities for hunting and fishing at three additional refuges.

With the changes in this proposed rule there will be 315 public hunting programs and 274 public fishing programs on national wildlife refuges. "Each year, millions of hunters and anglers enjoy their favorite pastime on national wildlife refuges and this year the USFWS is proposing to expand these opportunities," said Service Director Steve Williams. "Since 1903, America's national wildlife refuges have been special places for people to hunt and fish, watch and photograph wildlife, or simply enjoy the great outdoors. I am committed to providing opportunities for these activities wherever they are compatible with the refuge system's wildlife conservation mission."

The Service is adding the following refuges to the list of units open for hunting or fishing: Grand Cote National Wildlife Refuge (NWR) in Louisiana; Northern Tallgrass Prairie NWR in Minnesota and Iowa; Boyer Chute and North Platte refuges in Nebraska; Coldwater NWR in Mississippi; Bandon Marsh NWR in Oregon; and Rappahannock River Valley NWR in Virginia.

In addition, the Service proposed increased recreational hunting and fishing opportunities on three refuges in Arkansas, Iowa, and Louisiana, and other administrative changes to the general regulations governing hunting and fishing on refuges.

The USFWS proposes the following new or modified recreational hunting and fishing programs:

Migratory game bird hunting on refuges located in Louisiana, Minnesota, Iowa, Nebraska, and Arkansas; upland game hunting on refuges in Louisiana, Minnesota, Iowa, and Nebraska; big game hunting on refuges in Louisiana, Minnesota, Iowa, Nebraska, and Arkansas; and sport fishing on refuges in Mississippi, Oregon, and Virginia.

In 2002, there were two million hunting visits to national wildlife refuges and six million fishing visits. By law, hunting and fishing are two of the six priority wildlife-dependent recreational uses on national wildlife refuges, and individual refuges are encouraged to provide opportunities to hunt and fish whenever they are compatible with the refuge's conservation goals. The Service annually reviews hunting and fishing programs on national wildlife refuges to determine whether to add, modify or remove them. *Source: USFWS Press Release 27 August 2003*

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## **Molecular Biology Lab to Be Constructed at Galapagos Islands**

Private zoos and institutes are joining with universities and the Galapagos National Park to construct a molecular genetics laboratory on the island of Santa Cruz. The lab is scheduled to open in the late fall of 2003. One of the main purposes of the lab is to analyze genetic patterns of population structure in many species of flora and fauna living on the islands.

The lab will also do serology work in selected animals to hopefully identify antibodies pointing to previous pathogen infections. Scientists believe that introduced pathogens are the major long-term threat to biodiversity on the islands. Through the use of genetic analysis tools, it is hoped that diseases can be identified, leading to further discoveries of how they migrate to the islands and how they spread.

"Assessing and monitoring disease threats is a crucial part of conservation. For the Galapagos, all these activities in the past required sending material off the islands, with long turnaround times, which is no good if you're dealing with a fast-moving disease outbreak," said an ecologist from Princeton University.

The plan is to get the lab up and running, train Ecuadorians in lab procedures and operation, and then turn the lab over to Ecuador, s government two or three years down the road. *Source: The Scientist Daily News 12 August 2003*

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### **Conservation Organizations to Receive Funds for Neotropical Migratory Bird Conservation**

Conservation organizations in 15 states and 17 Latin American and Caribbean countries will share \$3 million in grants for neotropical migratory bird conservation, announced the USFWS. Partnering organizations will match these grants with \$13 million. There are 341 species of nearctic-neotropical migrants, birds that breed north of the Tropic of Cancer and winter south of that line. Examples of these birds include pelicans, vultures, falcons, cranes, owls, hummingbirds, bluebirds, and orioles.

"The conservation of neotropical migratory birds extends beyond our borders and depends on partnerships with other nations as well as states, conservation organizations and many others here at home," said Interior Secretary Gale Norton. "Through these grants, the Interior Department is contributing to on-the-ground conservation projects from Maine to Cape Horn."

The Neotropical Migratory Bird Conservation Act of 2000 establishes a matching grants program to fund projects that promote the conservation of neotropical migratory birds in the United States, Latin America and the Caribbean. The money can be used to protect, research, monitor and manage these bird's populations and habitats as well as in areas of law enforcement and community outreach and education.

"Neotropical migratory birds are important for our ecosystems," said Norton. "They work as nature's pest controllers, pollinators and provide many hours of enjoyment for birdwatchers and outdoor enthusiasts."

Projects funded in the United States include activities in California, New Jersey, Ohio, Georgia, Illinois, Iowa, Maine, Mississippi, New Mexico, New York, Ohio and Oregon. Projects in the Caribbean and Latin America include ones located in Mexico, Argentina, Belize, Nicaragua, Bolivia, Colombia, Peru, Ecuador, Venezuela, Suriname, Trinidad & Tobago, and the Dominican Republic.

*Source: USFWS Press Release 10 July 2003*

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### **Proposal to Eradicate Parrot Species on Maui**

Government wildlife authorities on the island of Maui, Hawaii, have proposed the eradication of a flock of mitered coures. The birds, in a flock estimated at about 200, that are purportedly threatening crops and native forest. A state wildlife biologist said that the birds are "a ticking time bomb" and they may become impossible to control. The birds are reported to eat a weed called miconia, dropping the plant,s seeds over the entire island and threatening other islands in the state,s chain.

The manager of the Maui Invasive Species Committee said that officials are considering a \$52,000 plan that includes land and air surveys to learn how big the bird population is and radio tracking to find out where they are nesting. So far, there is no specific plan for removal of the parrots but the state wildlife agency is considering shooting, trapping or netting as alternative methods. Funding for the project comes from the state and from the U.S. Department of Agriculture.

A veterinarian who operates a bird rescue center on the island said that she and her staff have tried to count the birds and have come up with only 80. She believes this is too small a number to pose a threat and is in opposition to the wildlife department,s plan of eradication. The birds apparently come from a single pair of pet birds released in the middle of the 1980s. *Source: Honolulu Advertiser Newspaper 11 August 2003*

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### **USFWS Releases Final EIS on Double-Crested Cormorant Management**

The USFWS recently released a Final Environmental Impact Statement (EIS) on the management of double-crested cormorants in the United States. The document analyzes various options for managing rapidly growing cormorant populations to reduce resource conflicts. Cormorants have been documented to have negative impacts on resources such as commercial aquaculture, recreational fisheries, vegetation, and the habitat of other colonially-nesting birds. The preferred alternative in this EIS will give local authorities a more active role in double-crested cormorant management.

The EIS evaluates six management alternatives including continuing current management practices, implementing only non-lethal management techniques, issuing depredation permits with more flexible



criteria, issuing a “public resource depredation order” to address public source conflicts, reducing regional cormorant populations, and establishing frameworks for a cormorant hunting season. The Service believes a “public resource depredation order” will be the most effective alternative.

Under the EIS’s preferred alternative, a new “public resource depredation order” will authorize States, Tribes, and U.S. Department of Agriculture’s Wildlife Services to manage and control double-crested cormorants to protect public resources (fish, wildlife, plants, and habitats). The order applies to 24 states (Alabama, Arkansas, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Michigan, Minnesota, Mississippi, Missouri, New York, North Carolina, Ohio, Oklahoma, South Carolina, Tennessee, Texas, Vermont, West Virginia, and Wisconsin).

Agencies acting under the order must have landowner permission, may not adversely affect other migratory bird species or threatened and endangered species and must satisfy annual reporting and evaluation requirements. The Service will ensure the long-term conservation of cormorant populations through annual assessments of agency reports and through regular population monitoring.

In 1998, the Service issued an aquaculture depredation order authorizing commercial freshwater aquaculture producers in 13 states to shoot double-crested cormorants without a federal depredation permit when the birds were found committing or about to commit depredations to aquaculture stocks. Under the EIS’s preferred alternative, the Service will modify the aquaculture depredation order to allow control of cormorants at winter roosts near fish farms and to allow fish hatcheries to protect their stock from cormorant predation.

Cormorants have been federally protected under the Migratory Bird Treaty Act since 1972 after their populations dropped precipitously due to factors such as the use of the pesticide DDT. Today, the population is at historic highs in many areas due in large part to the presence of ample food in their summer and winter ranges, federal and state protection, and reduced contaminant levels. The total estimated population of double-crested cormorants in North America is approximately two million birds.

The Final EIS can be downloaded from the Division of Migratory Bird Management web site at <http://migratorybirds.fws.gov/issues/cormorant> Source: USFWS Press Release 12 August 2003

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### **War Decimates Hippos**

One of the world’s largest hippo populations, in the Democratic Republic of the Congo’s Virunga National Park has dropped from 29,000 to 1,300 in less than three decades as “poachers and armed factions kill them for their meat and teeth” says *Planet Ark*, Reuters 9/2/03. Conservationists hope that a recent peace agreement ending the nation’s four-year civil war will allow the government to better “protect the rare mountain gorilla also found in the park, and halt the slaughter of hippos “in shocking numbers, as demand for their teeth increased in the illegal ivory trade.” Source: *GREENlines Issue #1941 9-3-03*

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### **Iceland Draws First Blood**

Iceland has killed its first minke whale, the first step in its renewed effort to resume commercial whaling reports *BBC News* 8/19/03. Although Iceland claims that the whaling is for scientific research, the U.S. expressed “extreme disappointment” and reiterated that “lethal research on whales is not necessary and the needed scientific data can be obtained by well-established, non lethal means.” The International Fund for Animal Welfare was more blunt, saying that “Iceland cannot use science to camouflage its desire to resume commercial whaling.” Source: *GREENlines Issue #1933 8-21-03*

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### **Pipeline Could Harm Endangered Species**

Conservationists are alarmed over a plan to build a 387-mile gas pipeline through “one of the world’s most threatened ecosystems,” the shortgrass prairie of eastern Colorado and western Kansas reports the *Land Letter* 8/14/03. The project, which is still in the planning phase and would connect natural gas fields in Wyoming’s Powder River Basin with Midwest and Eastern markets, could potentially harm both ESA listed and candidate species such as the bald eagle, piping plover, Preble’s meadow jumping mouse, least tern, whooping crane, Ute ladies, tresses and Colorado butterfly plant. Source: *GREENlines Issue #1930 8-18-03*

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### **Bald Eagle Recovery Linked to Clean Water**

Wildlife experts contend that the resurgence of bald eagles in Michigan - the number of nesting pairs has increased almost five fold since 1980 - is a "sign of cleaner lakes and streams" says the *Detroit Free Press*, AP 8/11/03. Officials credit the ban on DDT and PCBs, "along with other environmental cleanups, legal protection for eagles and broad public support" for the recovery and cleaner water but warn that "new sources of pollution or the introduction of new chemicals could harm the eagles." *Source: GREENlines Issue #1930 8-18-03*

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### **Fire Pushes Iberian Lynx to Brink**

Conservationists are warning that devastating forest fires that have burned some 830,000 acres in Portugal this summer "could drive the rare Iberian lynx closer to extinction" says *ENN*, Reuters 8/27/03. With only about 150 of the leopard-spotted cats left in the fire-ravaged mountains of southwestern Spain and Portugal, SOS Lynx advised "We could be on the verge of the first-ever big cat extinction since prehistoric times." Besides forest habitat, the fires have "also destroyed pastures that were feeding grounds for wild rabbits, the lynx's main prey." A drop in the rabbit population is cited a main cause of the lynx population dropping by 90% over the last decade. *Source: GREENlines Issue #1939 8-29-03*

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### **Albatross Near Extinction**

A new report from Birdlife International shows that longline fishing is "pushing six albatross species further towards the brink of extinction" says *www.scoop.co.nz* 9/5/03. New research "reveals a further alarming decrease in the populations of six of 21 albatross species, including one species previously regarded as safe." Longline fishing is credited with killing over 300,000 birds annually, of which 100,000 are albatross. As a result, "all albatross species are now considered to face varying risks of extinction largely owing to longline fishing." *Source: GREENlines Issue #1944 9-8-03*

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### **Emergency Effort to Save Pronghorn**

After dropping from about 138 animals two years ago, a desperate effort is underway to save the less than two dozen of Arizona's remaining pronghorn antelope says the *Tucson Citizen*, AP 9/8/03. The recovery effort is focusing on trying to increase fawn survival by irrigating small patches of desert vegetation and establishing a semi-captive breeding program, perhaps using a few of the 300 pronghorn left in northern Mexico. While Defenders of Wildlife has given the emergency program "qualified support," they say "the real issue with the pronghorns is severe habitat fragmentation and habitat loss because of all the barriers, a lot of fencing and roads that isolate pronghorn populations" and make it more difficult if not impossible to adjust to the severe drought. *Source: GREENlines Issue #1946 9-10-03*

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### **Deck Stacked Against Mexican Wolf**

In a letter to USFWS Southwest Regional Director, 15 conservation groups complained a "team being formed to revise a recovery plan for the endangered Mexican gray wolf is stacked, in favor of the livestock industry and anti-wolf groups" says the *Albuquerque Journal* 8/14. Of 11 members on the wolf recovery planning team, only three are conservation groups while the livestock industry has seven representatives, and the final group is "suing the USFWS over wolf reintroduction." The recovery team is updating the recovery criteria, which currently call for delisting, "once the wild population reaches 100 animals," a goal that could be met "in a year or two." *Source: GREENlines Issue #1933 8-21-03*

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### **Endangered Snakes No Problem**

A Wisconsin businessman has found that he can have a new store and protect habitat for the state's threatened Butler's garter snake at the same time says the *Milwaukee Journal Sentinel* 9/2/03. Even though the owner of Stu's Flooring Store spent an extra \$100,000 on expert consultants and project modifications, he's glad to go the extra mile. "I'm for protecting endangered species and plants," he said. "I believe in nature there's a reason for everything. It's no problem living side by side with endangered snakes." *Source: GREENlines Issue #1942 9-04-03*

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### **Predators Hammer Marmots**

A wolf and cougar have killed five Vancouver Island marmots, leaving "just two dozen of Canada's most endangered animals surviving precariously in the wild" says the *Victoria Times Colonist* 9/4/03. Two of the deceased marmots were recently reintroduced into the wild from a captive breeding population and although it is normal for cougars, wolves and eagles to prey on marmots, the small number remaining "makes it more difficult for the population to sustain continued assaults." The number of marmots has "plummeted since logging decimated its mountain habitat and made it easier for predators to seek them out." *Source: GREENlines Issue #1943 9-5-03*

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*Institutions wishing to advertise employment opportunities are asked to send pertinent data by the 10th of each month to: Opportunity Knocks/AKF, 3601 SW 29th St., Suite 133, Topeka, KS 66614-2054. Please include closing date for positions available, and when setting these dates keep in mind that because of bulk-mail, most readers do not receive their AKF until the middle of the month or later. There is no charge for this service and fax or e-mail listings of positions which become available close to deadline are accepted. Our Fax is (785) 273-1980; e-mail: [akfeditor@zk.kscoxmail.com](mailto:akfeditor@zk.kscoxmail.com)< Listing may be sent as MS Word attachment. We are no longer located at the Topeka Zoo, so please note new address to avoid delays in processing.*

**Animal Keeper** – Wildlife WayStation, Angeles National Forest, CA

Please e-mail cover letter and resumé to [icarefortheanimals@msn.com](mailto:icarefortheanimals@msn.com)< This is a full-time permanent position, benefits included. **Responsibilities:** Animal keeping involving permanent resident animals which may include big cats, bears, wolves, primates, birds of prey and other assorted native and exotic animals. Duties include daily routine husbandry, general maintenance of animal habitats and surrounding area, feeding and any special projects as directed by the Animal Manager. **Requirements:** Candidates must be able to lift 50 pounds and be receptive to working out of doors year around. This is a unique opportunity for the right individual to enter the animal care world.

**Primate Caretaker** – Primate Rescue Center, Inc., Nicholasville, KY

Please send your resumé to: Jennifer Caravello, 5087 Danville Road, Nicholasville KY 40356  
Please include with your resumé: a cover letter describing your experience and passion for animal welfare and a copy of your current drivers' license. Please, no calls or emails – we'll contact you. **Description/Responsibilities:** The PRC is a non-profit organization dedicated to the rescue and rehabilitation of apes and monkeys. We are not open to the public. Animal caretakers are responsible for enclosure cleaning and upkeep, feeding, enrichment and assisting with minor medical procedures. We do not have direct physical contact with animal of the animals, preferring that their main interactions be with their conspecifics. **Requirements:** We are looking for highly motivated individuals with common sense and the ability to develop creative solutions to any problems that arise. Good communication skills are essential; must be willing to work as a member of a team. Basic knowledge of primate behaviors, operant conditioning and enrichment a plus. Must be able to lift 50lbs. and have a current drivers' license. Minimum commitment is two (2) years. Salary is negotiable; housing may be available.

**Lead Keeper** - Frank Buck Zoo, Gainesville, TX

Interested persons should apply with The City of Gainesville, Human Resources Dept., 200 S. Rusk St., Gainesville, TX 76240; (940) 668-4590; [www.gainesville.tx.us.com](http://www.gainesville.tx.us.com)< **Position open until filled.** We are seeking a team-oriented individual to fill this position. We have small town appeal and a global attitude and interested candidates should have the same. **Responsibilities:** This person will supervise a staff of five (5) and participate in the day-to-day care and maintenance of our 120+ animals and the facilities. **Requirements:** Candidate must have strong leadership skills, be highly motivated, and have lots of initiative and good communication skills. Knowledge of ISIS data entry would be helpful. Position requires an Associate or Bachelor's degree in one of the life sciences and/or the right combination of exotic animal experience. Salary ranges from \$24,532.00 annually with benefits package.

**Mammal/Bird Keeper** - Cougar Mountain Zoo, Issaquah, WA

Please send a cover letter and resumé to: Cougar Mountain Zoo, 19525 SE 54th, Issaquah, WA 98027; or Fax to (425) 392-1076; or E-mail to [CougarMZoo@aol.com](mailto:CougarMZoo@aol.com)< This is a Full Time permanent position, benefits included. Salary depends on experience. **Responsibilities:** animal keeping involving some of the following species: cougars, lemurs, hoofstock (reindeer/antelope/deer), macaws, parrots, cranes and others. Daily routine husbandry, maintenance of exhibits, record keeping, assist in veterinary practices, behavior enrichment, etc. Involvement in Education such as tour guide, mini lecture speaker, animal demos and walks, outreach presentations, etc. **Requirements:** Ability to work in a harmonious manner with staff, volunteers and supervisors and work any of the seven days of the week. Prefer AS/BS degree in biology/zoology-related field and minimum of two (2) years full-time paid experience in zoological institution.

**Keepers/Vet. Technicians** - The Hattiesburg Zoo, Hattiesburg, MS

For more information regarding this position please contact John Wright, General Curator, Hattiesburg Zoo, Hattiesburg, MS 39401, (601) 545-4576, email: [jwright@hattiesburgms.com](mailto:jwright@hattiesburgms.com)< This is a full-time position with state benefits, salary commensurate with experience and qualifications. **Responsibilities:** The Hattiesburg Zoo is currently updating its Animal Care candidate pool. We seek career-driven, creative, team-oriented individuals. Future openings, will be responsible for, but not limited to the following; daily husbandry, exhibit cleaning and maintenance, diet preparation and feeding, documentation, conditioning and training of collection, educational programs, and veterinarian assistance. **Requirements:**

Job requires minimum high school graduate (college degree preferred), one (1) year experience at an AZA institution (paid or volunteer), experience with a diverse collection.

#### **Zoo Keeper/Grasslands** - Audubon Zoo, New Orleans, LA

Send resumé to: Director of Human Resources, Mike Burnett, 6500 Magazine St., New Orleans, LA 70118 or email to: [mburnett@auduboninstitute.org](mailto:mburnett@auduboninstitute.org)

**Requirements:** Good written/oral communication skills and the ability to work effectively in a team-oriented environment. Associate's degree in biology or related field and one (1) year experience preferred or equivalent combination of training/experience in the care of mammals, preferably hoofstock, carnivores and primates. All candidates must have the ability to lift 80 lbs. and a willingness to work outdoors. A willingness to work weekends, holidays, and/or overtime is also required.

**The following three (3) internship opportunities are available at the New Jersey State Aquarium -** The New Jersey State Aquarium husbandry department is currently holding open enrollment on all our internships.

#### **Avian Internship**

Interested candidates should submit a cover letter and resumé, transcripts, three (3) letters of recommendation, and an application from our website at [www.njaquarium.org](http://www.njaquarium.org). Please submit materials to: New Jersey State Aquarium, c/o Kyla Fox, One Riverside Drive, Camden, NJ 08103. Become familiar with daily activities involving our colony of African penguins, exotic birds, and reptile collection. **Responsibilities:** Duties include food preparation, exhibit maintenance, and creation of enrichment devices. **Requirements:** Candidates should be comfortable with public speaking and have course work in biology/psychology. Must be able to work outdoors and lift 50 pounds. Interns are required to complete a minimum of 120 hours and must be registered for college credits in either a two or four-year school. Internships may be completed during spring, summer, or fall sessions. All intern positions are on a volunteer basis and are unpaid.

#### **Marine Mammal Internship**

Interested candidates should submit a cover letter and resumé, transcripts, three (3) letters of recommendation, and an application from our website at [www.njaquarium.org](http://www.njaquarium.org). Please submit materials to New Jersey State Aquarium, c/o Collette Caprio, One Riverside Drive, Camden, NJ 08103. Learn daily activities involving animal care and training with our Seal Team. **Responsibilities:** Duties include food preparation, exhibit cleaning, creating enrichment devices and observing training. **Requirements:** Candidates should be comfortable with public speaking, have course work in biology/psychology, prior animal experience, be able to work outdoors, and lift 50lbs. Interns are required to complete a minimum of 120 hours and must be registered for college credits in either a two or four-year school. Internships may be completed during spring, summer, or fall sessions. All intern positions are on a volunteer basis and are unpaid.

#### **Fish and Invertebrate Internship**

Interested candidates should submit a cover letter and resumé, transcripts, three (3) letters of recommendation, and an application from our website at [www.njaquarium.org](http://www.njaquarium.org). Please submit materials to New Jersey State Aquarium, c/o Nicole Grandinetti, One Riverside Drive, Camden, NJ 08103. The Fish and Invertebrate department offers internships each semester to qualifying candidates. **Responsibilities:** The interns main responsibilities will be assisting the biologists with their daily duties including exhibit and holding tank maintenance, food preparation, feeding, filter maintenance, and learning all aspects on maintaining saltwater exhibits. **Requirements:** Interns must complete 120 hours within the semester working two eight-hour days. The typical hours for the day are from 7:30am to 4:30pm. Interns are also required to be registered for credits through a two or four- year institution. All Interns work under a volunteer basis and are unpaid.

#### **Big Cat Internship** – Wildlife on Easy Street, Tampa, FL

For more information contact Scott Lope at 813-323-5991 or email at [catfoto1@aol.com](mailto:catfoto1@aol.com)

Two (2) positions available for six-month internship at TAOS accredited non-profit big cat sanctuary. [www.wildlifeoneasystreet.com](http://www.wildlifeoneasystreet.com) **Responsibilities** (include but are not limited to): daily husbandry, exhibit cleaning, diet preparation, feeding, operant conditioning and behavioral enrichment for the following species: lions, tigers, leopards, cougars, lynxes, servals, caracals, bobcats, lemurs and other exotic animals. We provide invaluable hands-on experience, on-site housing and utilities, safety training and educational materials. Advanced training and long-term employment opportunities exist for the right candidates. **Requirements:** applicants must be willing to work six days a week, some holidays and follow strict safety guidelines. Hard work ethic and love of animals more important than degree.



### **Internships** - The Florida Aquarium, Tampa, FL

Internships are available in Animal Health, Animal Programs and Husbandry departments. Internships available year-round for varying lengths of time and can be tailored to the individual student's needs. Internships are unpaid but provide valuable hands-on experience. Interested persons should send resumé to: Human Resources, 701 Channelside Dr., Tampa, FL 33602. For more information visit our website at [www.flaquarium.org](http://www.flaquarium.org) < **Responsibilities:** food preparation, feeding, cleaning enclosures, assist with medical procedures, animal observations, daily record keeping, enrichment activities, assist with training sessions and shows.

### **Aviculture Interns** - Keauhou Bird Conservation Center, Hawaii and Maui

For more information on internships at **KBCC**, please send a resumé, cover letter, and the names and contacts of three (3) references to: Tracey Goltz P.O. Box 39 Volcano, HI 96785 or fax: 808-985-7034. **OR**, for more information on internships at **MBCC**, please send this information to: Mary Schwartz 2375 Olinda Road Makawao, HI 96768 or fax: 808-572-3574. For the Hawaii Endangered Bird Conservation Program at the Keauhou Bird Conservation Center (KBCC) on the Big Island of Hawaii and the Maui Bird Conservation Center (MBCC) on the island of Maui. **Responsibilities:** Daily tasks include husbandry duties such as: diet preparation, aviary and facility maintenance, behavioral observations of breeding birds, grounds keeping, predator control. **Requirements:** Applicant must be able to live with several roommates in a remote area and should show enthusiasm for work with captive endangered Hawaiian birds. Applicant must have a valid driver's license and health insurance. Internships last for a 3-6 month period. Interns receive \$20/day stipend plus housing. **Please, no phone calls or emails.**

### **Service Opportunities or Internships** - Tiger Creek Wildlife Refuge, Tyler, TX

See additional information and application at our website - [www.tiger creek.org](http://www.tiger creek.org) < Commencement date: Open. Duration: Month by Month. Interested in learning more about big cats and a career path? Consider a service opportunity at TCWR. Two (2) positions currently available at Tiger Creek Wildlife Refuge, Tyler, TX. Interns are utilized for animal care positions through a qualification system. We provide: Room & Board, Materials and Curriculum, Indoctrination and Safety Training, Opportunity for full-time paid animal keeper positions (after training).

### **Internship Opportunities - National Aquarium in Baltimore**

To apply for any of the following internship positions go online at [www.aqua.org/education/internships](http://www.aqua.org/education/internships) to obtain an application form. A complete application includes contact information, answers to brief statements listed, and a copy of college transcript. Complete applications should be sent to: National Aquarium at Baltimore-Internships, Pier 3/501 East Pratt St., Baltimore, MD 21202.

Application Deadline: ongoing - 1 November 2003 for January and Spring terms of 2004; 1 April 2004 for Summer and Fall 2004 terms; All interns must complete a minimum of 120 hours of work within the selected term. Interns must receive college credit for their internship. Internships are unpaid. For further information contact the National Aquarium in Baltimore's Internship coordinator at [intern@aqua.org](mailto:intern@aqua.org) or call (410) 576-3888.

#### **Aquarist Intern**

**Responsibilities:** The selected candidate will assist the Aquarium aquarist staff with daily care of the Aquarium's invertebrates and fish. Assist with tank maintenance and cleaning; Prepare daily diets and perform daily feedings; Assist in the maintenance of back-up areas; Conduct precise record keeping; Perform special projects to be determined by the aquarist staff. **Requirements:** College juniors or seniors enrolled in an accredited college, pursuing a degree in Biology, Ecology, Environmental Science, or a related field. Must be able to lift 50 lbs, climb up a 6' ladder, and be able to squeeze across a 15' long x 12" wide platform.

#### **Aviculture Intern**

**Responsibilities:** The selected candidate will assist the Aquarium aviculture staff with daily husbandry activities in the South American Rainforest exhibit. Assist with and perform diet preparation and distribution; Conduct animal observations; Assist in the cleaning of holding areas, kitchen, and food prep areas; Provide enrichment to the aviculture collection; Perform special projects at be determined by the aviculture staff. **Requirements:** Interest in working with birds. Enrolled in an accredited college, pursuing a degree in Biology, Zoology, Animal Behavior, Ecology, Environmental Science, or a related field.

#### **Herpetology Intern**

**Responsibilities:** Tend the "Hidden Life" exhibits (large wall terrariums where small, neotropical lizards, frogs, snakes and invertebrates are on public display); Mist and clean the off-exhibit colony of small

arboreal lizards; Mist, clean and otherwise help tend the large, off-exhibit collection of neotropical frogs; Prepare diets for and feed the on and off-exhibit iguanas and tortoises; Tend the locust (live food) colony, orb-weaving spiders and colonies of non-venomous exotic arthropods (wood and hissing roaches, millipedes and walking sticks); Assist in the maintenance of the live food cultures (fruit flies, springtails, crickets, rats, mice); Conduct and record animal observations; Perform special projects as determined by the herpetology staff. **Requirements:** Must be enrolled in an accredited college, pursuing a degree in Biology, Zoology, Animal Behavior, Ecology, Environmental Science or a related field. Must be comfortable working with frogs, lizards, rodents and terrestrial arthropods.

#### Horticulture

**Responsibilities:** The selected candidate will assist the Aquarium horticulture staff with daily activities. Assist with care of plants in the Rain Forest exhibits; Conduct plant maintenance, fertilization, propagation, and transplantation; Assist in display development; Perform special projects as determined by the horticulture staff. **Requirements:** Must be enrolled in an accredited college, pursuing a degree in Biology, Ecology, Environmental Science, or a related field.

#### Marine Animal Rescue Program (MARP) Intern

**Responsibilities:** The selected candidate will aid in all aspects of marine animals rescue program (MARP) operations, which involves the rescue, rehabilitation, and release of stranded marine mammals and sea turtles and implementing outreach efforts of the Aquarium's Ocean Health Initiative. The selected candidate is also responsible for technical and clerical assistance for the Conservation Department staff as necessary.

**Duties include:** Animal Care – participating in rescue and release trips, daily feeding, medical treatments, facility maintenance including cleaning and water changes, behavioral observations, and record keeping; Outreach – learning to interpret the MARP artifacts and conservation messages and participation in seasonal outreach and public education programs at the Aquarium and off site; Other duties as assigned – field work, etc. **Requirements:** Must be college junior or senior majoring in environmental science or related field with course work in biology and ecology. Summer and January terms require 40 hours per week of work for 4 weeks. Spring and fall terms require 8 hours per day, one day per week of work.

#### Marine Mammal Trainer Intern

**Responsibilities:** The selected candidate is responsible for providing support to the marine mammal training staff. This internship's primary purpose is to teach the intern training theory. ***There is limited hands-on animal contact during the internship.*** **Duties will include:** Prepares daily animal diets and dispenses vitamins as instructed; Responsible for the cleanliness and safety of all animal back-up areas; Assists in training, husbandry, and medical sessions; Participates in pre-show and pre-session preparations; Periodically participates in sessions involving swimming during enrichment and play sessions – no animals involved; Other duties as assigned. **Requirements:** Must be college junior or senior majoring in life science or related field. Must have a basic understanding of marine mammal natural history. Must have good swimming skills. Must work well as a team member. Summer and January terms require 40 hours per week of work for 4 weeks. Spring and fall terms require 8 hours per day, one day per week of work.

#### Water Quality Lab Intern

**Responsibilities:** The selected candidate will assist in the water quality testing of all fish and mammal systems throughout the aquarium. Duties include testing water for salinity, pH, ammonia, nitrite, alkalinity, and copper according to lab procedures, and recoding neat, accurate data. The selected candidate will work closely with the Lab Technicians and the Animal Husbandry staff. **Requirements:** Must be college junior or senior with general biology and chemistry work. Strong math skills and computer proficiency preferred. Must be available to work mornings.

#### SOS Rhino Seeks Volunteers

SOS Rhino is looking for volunteers interested in helping us in our efforts to save the Sumatran rhinoceros. Our Borneo Team is studying the demographics of the remaining animals in Tabin Wildlife Reserve to determine when patrol units, habitat protection, or translocation may play a role in the rhinos' survival. Please visit SOS Rhino's web site for detailed information: <http://www.sosrhino.org/programs/volunteer.php> Or contact Cindy Salopek, Projects Associate/SOS Rhino via e-mail at: [cindy@sosrhino.org](mailto:cindy@sosrhino.org)

*Positions posted with AAZK, Inc. may also be found on  
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Full-time Keepers Only

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\$30.00 Associate  
Those not connected with  
an animal facility

☐

\$60.00 or up - Individuals  
Contributing/U.S.

☐

\$100.00 or up  
Institutional/U.S.  
Organizations/Institutions  
(requires Board approval)

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International Members  
\$50.00 International  
All members outside U.S. &  
Canada regardless of category

Canadian Members

☐

\$35.00 Professional  
Full-time Keepers

☐

\$60.00 Professional  
Renew for 2 years & save  
Full-time Keepers Only

☐

\$35.00 Affiliate  
Other staff & volunteers

☐

\$35.00 Associate  
Those not connected with  
an animal facility

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\$60 or up - Individuals  
Contributing/Canada

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\$100.00 or up  
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Organizations/Institutions  
(requires Board approval)

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Library Only  
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Available only to public  
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Work Area \_\_\_\_\_

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Mail this application to: AAZK Administrative Offices, 3601 S.W. 29th, Suite 133 Topeka, KS 66614-2054. Make checks/money orders payable to AAZK, Inc. Must be in U. S. FUNDS ONLY. Membership includes a subscription to *Animal Keepers' Forum*. The membership card is good for free admission to many zoos and aquariums in the U.S. and Canada.



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Topeka, KS 66614  
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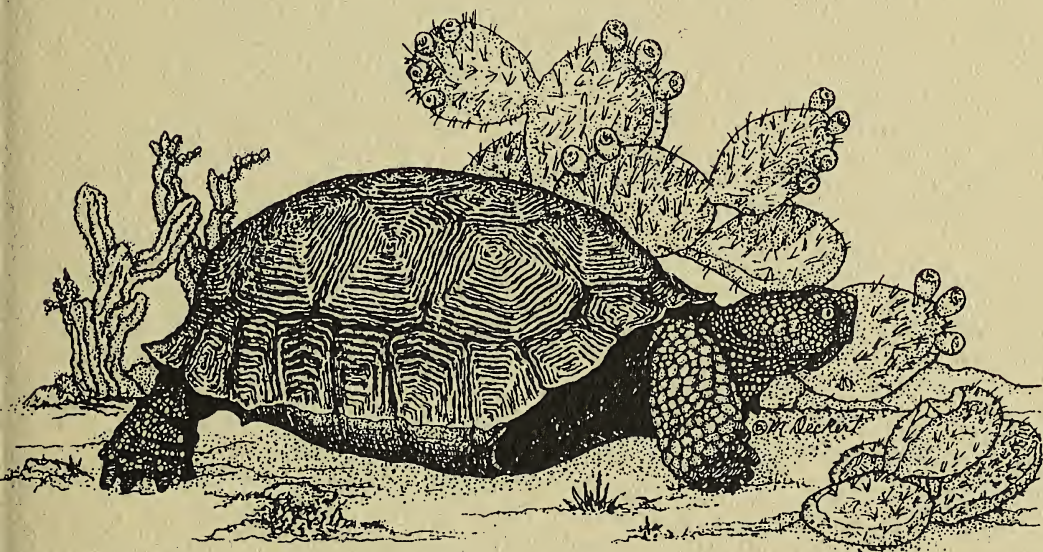


Animal Keepers' Forum  
25th Anniversary  
1974 - 1999



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# ANIMAL KEEPERS' FORUM



**The Journal of the American  
Association of Zoo Keepers, Inc.**

**NOVEMBER 2003**

**Managing Editor:** Susan D. Chan • **Associate Editors:** Kayla Grams, Lovell, WY & Mark de Denus, Reid Park Zoo • **Enrichment Options Coordinators:** Dawn Neptune, Utah's Hogle Zoo & Rachel Cantrell, Disney's Animal Kingdom • **Legislative Outlook Column Coordinator:** Georgann B. Johnston, Sacramento, CA. • **ABC's Column Coordinator:** Diana Guerrero, Big Bear Lake, CA • **Reactions Column Coordinator:** William K. Baker, Jr., Little Rock Zoo • **The Water Column Coordinators:** Dan Conklin and Kevin Shelton, The Florida Aquarium and Bruce Elkins, Indianapolis Zoo

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also serves as AAZK Liaison to the American Zoo & Aquarium Association (AZA)

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AAZK Enrichment Notebook 3rd Edition - Lee Houts, Folsom City Zoo



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## About the Cover....

This month's cover features a Desert Tortoise (*Gopherus agassizii*) drawn by Mary Deckert, a Docent at the Los Angeles Zoo, Los Angeles, CA. One of four species known as gopher tortoises, this reptile is native to the Mojave and Sonoran deserts of southeast California, southern Nevada, south through Arizona and into Mexico. More terrestrial than a turtle, the desert tortoise goes to water only to drink or bathe and an adult may survive a year or more without access to water. They live in an inhospitable climate where ground temperatures may reach 140°F (60°C), thus they spend at least 95% of their life in burrows away from the extreme heat. They have flattened front limbs which are especially adapted for burrowing. They average 8-15 lbs. (3.6-6.8kg) with a carapace length of 9-15 in. (23-38cm) and a height of 4-6 in. (10-15cm). They reach sexual maturity at 15-20 years of age and may live from 80-100 years. Mating occurs from Aug.-Oct. with the female producing a clutch of 4-8 eggs which hatch after an incubation period of 90-120 days. Their diet, from which they extract most of their moisture, consists of herbs, grasses and wildflowers. Predators, especially for the young, include ravens, gila monsters, kit foxes, badgers, roadrunners and coyotes. Thanks, Mary!

Animal Keepers' Forum publishes original papers and news items of interest to the animal keeping profession. Non-members are welcome to submit articles for consideration. Articles should be typed or hand-printed and double-spaced. Authors are encouraged to submit their manuscripts on a disk as well as in hard copy form. Manuscripts submitted either on disk or electronically as attachments to an email should be submitted in Microsoft WORD. All illustrations, graphs, charts and tables should be clearly marked, in final form and should fit in a page size **no greater than 5.5" x 8.5"** (14cm x 22cm). Literature used should be cited in the text (Brown, 1986) and alphabetically in the final bibliography. Avoid footnotes. Include scientific name (as per ISIS) the first time an animal name is used. Thereafter use common name. Use metric system for weights and measurements (standard equivalents may be noted in parenthesis). Use the continental dating system (day-month-year). Times should be listed as per the 24-hour clock (0800, 1630 hrs. etc.). Glossy black and white or color prints (minimum size 3" x 5" [8cm x 14cm] ) are accepted. Clearly marked captions should accompany photos. Please list photo credit on back of photo. Photographs may be submitted electronically as either JPEG or TIFF file attachments.

Articles sent to *Animal Keepers' Forum* will be reviewed by the editorial staff for publication. Articles of a research or technical nature will be submitted to one or more of the zoo professionals who serve as referees for *AKF*. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Lengthy articles may be separated into monthly installments at the discretion of the editor. The editor reserves the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed, appropriately-sized envelope. Telephone, fax or email contributions of late-breaking news or last-minute insertions are accepted as space allows. Phone 1-800-242-4519 (US); 1-800-468-1966 (Canada); FAX (785) 273-1980; email is [akfeditor@zk.kscoxmail.com](mailto:akfeditor@zk.kscoxmail.com)

**Deadline for each regular issue is the 10th of the preceding month.  
Dedicated issues may have separate deadline dates and will be noted by the editor.**

Articles printed do not necessarily reflect the opinions of the *AKF* staff or the American Association of Zoo Keepers, Inc. Publication does not indicate endorsement by the Association.

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E-Mail Addresses: You may reach Barbara Manspeaker at AAZK Administrative Offices at: [aazkoffice@zk.kscoxmail.com](mailto:aazkoffice@zk.kscoxmail.com) You may reach Susan Chan and *Animal Keepers' Forum* at: [akfeditor@zk.kscoxmail.com](mailto:akfeditor@zk.kscoxmail.com)

**AAZK Website Address: [www.aazk.org](http://www.aazk.org)**

**BFR Website: <http://bfr.aazk.org>**



# *Scoops & Scuttlebutt*



## **AAZK 2003 National Conference Wrap-Up**

Well, the dust is settling and the damage is being assessed here in C-Town. We all feel like a bride after her wedding day....you know, all that work and now it's all over! On behalf of the Cleveland AAZK Chapter, I would like to thank the 286 delegates who came to our "little shindig". A total of 34 states and two countries were represented at the 30<sup>th</sup> National Conference. Also, a big thanks to all the Chapter support, monetarily and emotionally. We have received some wonderful feedback about the good times that were had by all. Over \$7,000 was raised in the silent and live auction....thank you for opening those wallets!



Last but not least, the end of an era came during the conference. Virgil Baird of Toledo Zoo made his last appearance in Cleveland as the Hospitality King. We were honored that he chose us to be his "swan song". He has selflessly served up beer for AAZK delegates since 1991. On Mon., 29 Sept., he was honored with buttons bearing his likeness, and his own brew of Virgil's "Big Woody Lager". I was told that a tear was seen. He is looking for an apprentice...is it a union job? Virgil can now attend conferences and just sit back and enjoy. Let's all buy him a beer in Dallas....at the hospitality suite of course! **Thank you Virgil and everyone who made the conference run smoothly.**

*Take it away Dallas.....*

## **From the Bowling for Rhinos Chair**

Please send your 2004 Bowling for Rhinos event date and contact information ASAP to: PattyPearthree, c/o BFR, 318 Montibello Dr., Cary, NC 27513. Chris Hartley from the Blue Rhino Gas Company will then contact local Blue Rhino companies in your area to get their support and participation in your event.

## **AAZK Grant Committees Announces 2003/2004 Recipients!**

The AAZK CPR (Conservation, Restoration, and Preservation) Grant Committee is pleased to announce the awarding of \$1,000.00 to Karen Povey of the Point Defiance Zoo and Aquarium for her project "Enhancing Clouded Leopard Awareness for North American and Thai Audiences Through the Development of Clouded Leopard Learning Kits".

The AAZK Zoo Keepers in Research Grant Committee has been renamed the AAZK Members' Research Grant Committee. This committee is pleased to announce the awarding of \$1,000.00 to Tammy Root and Karen Imboden of the Indianapolis Zoo for their project "Semen Collection in Rockhopper (*Eudyptes crestatus*) Penguins".

## **Foraging for Enrichment Ideas?**

We would like to share ours with you! The Newark Museum Mini Zoo Animal Keepers have compiled over 100 enrichment activity write-ups for cotton-top tamarins and dwarf mongoose. We have had successful experience with anything from mirrors to windchimes to remote-controlled baby mobiles! Receive copies by fax or mail with updates every six months. Contact: Kristen Schmid, Senior Animal Keeper, The Newark Museum Mini Zoo, 49 Washington St., Newark, NJ 07102; (973) 596-6671; [kschmid@newarkmuseum.org](mailto:kschmid@newarkmuseum.org)

## **An Opportunity for Professional Development Through S.A.G. Participation**

The AAZK Professional Development Committee is pleased to announce an opportunity for professional members. AZA has requested an individual to represent AAZK, Inc. on the Green S.A.G. (Scientific Advisory Group). A S.A.G. is an AZA committee of zoo-based and university scientists focused on a particular topic area. They serve as technical advisors to other AZA groups and liaisons with institutions working on topics of interest to the zoo community. The Green S.A.G. will be focused on environmental and recycling issues. Interested individuals must be able

to attend one meeting (AZA National) and commit at least one year of service (AZA has asked for 3 years). AZA membership is a plus but not required. There is no financial support, so the support of your institution will be essential.

If Green Practices are your passion, submit your information and qualifications to Linda King at [Lmking83@aol.com](mailto:Lmking83@aol.com). **Deadline is 10 December 2003.** Questions? Call Linda at (214) 670-7741.

### **2004 Gorilla Workshop Planned in Calgary**

The Calgary Zoo is excited to announce that we are planning to host a gorilla workshop in the summer of 2004! With the opening of our new "Destination Africa" pavilion and its huge new living quarters for our troop of nine gorillas, we thought it only appropriate to host a workshop to celebrate!

Plans are starting to come together and we have a website set up for those interested in more details and for registration information. We have also set up a travel fund that we encourage everyone to contribute to. This fund will be awarded to keepers who might not otherwise be able to attend. Please go to our website and check back regularly for updates. The website address is: <http://2004gorillaworkshop.tripod.com><

We are planning the workshop starting Friday 25 June, 2004 with registration and icebreakers through Monday 28 June at the Glenmore Inn and Convention Centre. There will be round-table forums, guest speakers and plenty of time for keepers to exchange ideas and husbandry experience. (Please bring a favorite gorilla treat recipe, your enrichment ideas and any photos or video that demonstrates these...) We are also planning to have pre- and post- conference trips planned for you to enjoy the beauty of Alberta's mountains and prairies. There will be zoo tours of our new facility and we are also planning the event close enough that you can take in the world-renowned Calgary Stampede at the beginning of July.

We are also wanting to solicit papers from the gorilla community as we plan to have various topics discussed such as, but certainly not limited to, general gorilla husbandry and the need for bachelor groups, environmental and behavioral enrichment and training, veterinary and dietary concerns, conservation, education and the ever-increasing concern about the bushmeat crisis. Not only will this workshop be for those who work directly with gorillas, but we would also like to gear it to students, researchers, docents and other gorilla enthusiasts. Please submit presentation titles with a brief synopsis quickly as deadlines are looming! We look forward to seeing you in Calgary, Alberta, Canada next summer!

### **A Global Field Guide of Wildlife Tracks- Project Announcement**

I am a young conservation biologist seeking the cooperation of the international zoo community to assist in the implementation of a simple project with big potential. The project is outlined below and I am advertising at this stage to gauge the level of interest/likely cooperation.

The objective of the project is to develop a web-based 'encyclopaedia' of wildlife tracks. The purpose is to provide freely accessible data which can be used by researchers/conservation workers/wildlife managers to effectively monitor the distribution and population trends of cryptic (nocturnal/rare/elusive/wide ranging) species using tracks.

Monitoring species distribution and population trends is vital for wildlife management and conservation projects. Methods such as line transect census, mark-recapture and camera trapping are often used, but these techniques are expensive and time-consuming for cryptic species. Track identification has been shown to be a cost-effective, repeatable and objective alternative. However, the use of tracks is limited by the lack of data describing appropriate measurements and sample sizes necessary to accurately identify species, individuals, age groups and sexes.

Once it has been determined how to identify individuals of a particular species, the information could also be used for monitoring reintroductions.



The potential to provide data for wildlife conservation is limited only by the co-operation of zoos and species held in zoological collections. Due to in-house records, species held in zoological collections provide a source of information difficult to obtain from wild counterparts including individual identity, sex, weight, age, and relationships (related individuals might have tracks that are more similar). Having such information would provide a unique opportunity to study how these factors can be discriminated by and affect the analysis of tracks/trails for a wide variety of species without the investment of time and money necessary for a similar study of wild individuals.

For the first stage in this project, I intend to focus on *Panthera onca* and *Puma concolor* tracks. I am seeking to engage the co-operation of institutions with either/both of these species. Following the collation of data for these species the results will be published in an international journal and the project expanded to encompass species from around the globe. The work will continue as long as there are new species/updates to be added to the database. What is needed is for keepers to be willing to spend time taking pictures and measurements of tracks free of charge and institutions to agree to the work and supply relevant details. I intend to provide all equipment necessary for the project, costs to zoos should therefore be minimal. If you think the institution you work for would be prepared to participate in the project or want to know more i.e., personal details/ full project proposal please email: [darren\\_tracks@hotmail.com](mailto:darren_tracks@hotmail.com) <---submitted by Darren Norris

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## GREENlines Issues - from the Endangered Species Coalition

**700 Species Completely Unprotected** - A new study presented to the World Parks Congress reveals that over 700 species, "at least 223 bird, 140 mammal and 346 amphibian species threatened with extinction have no protection whatsoever over any parts of their range" reports *Yahoo News/Reuters*. The study by the World Conservation Union (IUCN) and Center for Applied Biodiversity Science warned that "without an immediate and strategic expansion of the protected area system, scientists expect a major wave of extinctions within the next few decades." Although 12% of the planet is "officially" protected, many of the refuges are "so-called paper parks which in fact offer few safeguards" and many other are "so small in size as to be virtually ineffective in conserving species." Source: GREENlines Issue #1949 9-15-03

**Extinction Stalks Lions** - Wildlife biologists are reporting that in the last two decades the number of African lions has dropped from 200,000 to only 23,000 reports *BBC News*. In fact, "populations of all African predators are plummeting," with the number of wild dogs between 3,500 and 5,000 and the fewer than 15,000 cheetahs left. The primary problem is a growing number of people, armed with modern weapons and poisons have become highly effective in killing predators to protect their livestock. Scientists contend the only hope is for "local people to earn money from predators, either through tourism or through sport hunting." Source: GREENlines Issue #1956 9-24-03

**10-20 Years Left for Orangutans** - A leading researcher is warning that illegal logging could doom the orangutan to extinction in the wild within 10 to 20 years says *Yahoo News/Reuters*. The 15,000 to 24,000 remaining wild orangutans all live in Indonesia and Malaysia and "by some estimates, more than 80% of all orangutan habitat had been destroyed over the past two decades and deforestation in Indonesia was escalating." In Borneo's Gunung Palung National Park, home to about 10% of the world's orangutans, the great apes have been "deeply traumatized by the logging, behaving erratically and eating little." Source: GREENlines Issue #1964 10-6-03

**Seed Bank Races Extinction** - British scientists at the Millennium Seed Bank are "racing against time to save from extinction as many of the world's endangered plants as they can" reports *Planet Ark/Reuters*. So far, they have collected some 300 million seeds from nearly 8,000 species of plants and trees, stored in glass jars at -4°F, "awaiting the day the scientists hope will never come - when the species no longer exists in the wild." The goal of the seed bank is to "collect 10% - or 24,000 species of the world's seed-bearing plants by 2010." Scientists now estimate that "within half a century a combination of climate change and environmental pressure will put a quarter of the world's plant species on the condemned list." Source: GREENlines Issue 1961 10-1-03

# From the President.....

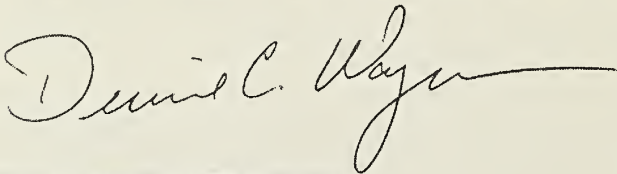
The 30<sup>th</sup> Annual Conference of the American Association of Zoo Keepers, Inc., hosted splendidly by the Greater Cleveland Area AAZK Chapter, has come and gone. So to has the first ever International Congress on Zookeeping (ICZ) held in The Netherlands. Both conferences were well attended, an evident commitment on the part of animal care professionals worldwide to continue to learn and grow. This Association should be very proud of its continued support of professional development for its members and its dedication to improving captive animal care throughout the world. There were many new faces joining familiar ones in Cleveland, and twenty six countries were represented at the ICZ. An amazing opportunity to learn from one another!

There are new and exciting things on the horizon for AAZK. *Biological Information on Selected Mammals*, AAZK's newest publication is now available through the Administrative Office. This publication is 1396 pages long and contains biological data on 590 species of mammals. It has been produced on CD which will make it considerably easier to tote around. It's also a commitment to go towards a more "green" approach. Look for an order form elsewhere in this issue of *AKF*.

The first revamp of the website has already taken place but there are still more changes ahead. The logistics of a "Members Only" section are being worked out and soon the Animal Data Transfer, Enrichment Data Transfer, and Operant Conditioning Data Transfer forms will be available for download from the website as well.

The 3<sup>rd</sup> Edition of the Enrichment Notebook is in its final stages of production and will be available on CD. Look for it soon. We are also looking at developing a line of merchandise unique to AAZK. And finally, the AAZK/AZA course "Advances in Animal Keeping in Zoos and Aquariums" will be taught for the first time in Houston, TX in April of next year.

This Association is on the move and I'm very proud to be connected with each and every one of you through this forum. I look forward, as do Kevin, Jacque, Bruce, Bob, Jeannette, and Shane, to serving your needs in the coming years. Questions, comments, and suggestions are welcome as we are here to represent you. Take care and be safe!



Denise C. Wagner, AAZK President  
The San Diego Zoo's Wild Animal Park  
Escondido, CA





# Coming Events

**The Sixth International Conference on Environmental Enrichment** - 2-7 November 2003 in Johannesburg Zoo, South Africa. Sixth International Conference on Environmental Enrichment in Johannesburg Zoo, South Africa. Hosted by the Johannesburg Zoo. For more information on the conference, including fees, registration facilities, reduced flights and pre- and post-conference tours, please go to [www.jhbzoo.org.za](http://www.jhbzoo.org.za) or contact Mathew van Lierop at [mathew@jhbzoo.org.za](mailto:mathew@jhbzoo.org.za) or on +83 600 2677.

**Karen Pryor Clicker Expos 2003/2004**

7-9 November 2003, Chicago, IL; 23-25 January 2004, Berkeley, CA; and 26-28 March 2004, West Chester, PA. Each Clicker Expo will feature 15 main stage presentations and 18 workshops over three days. Topics will cover the latest operant conditioning techniques utilized for domestic as well as zoo and aquarium animals. For a full schedule and registration information, visit [www.clickertraining.com](http://www.clickertraining.com)

**ACVP/ASVCP 2003 Concurrent Annual Meeting**

- American College of Veterinary Pathologists and American Society of Veterinary Clinical Pathology joint meeting - 15-19 November, 2003 in Banff, Alberta, Canada. For more info contact ACVP at: Phone - (608) 833-8725 ext. 145; Fax - (608) 831-5485; email - [meetings@acvp.org](mailto:meetings@acvp.org); web - [www.acvp.org/meeting/](http://www.acvp.org/meeting/)

**First Annual Crissey Zoological Nutrition Symposium**

- 12-13 December 2003 in Raleigh, NC. To be held at the College of Veterinary Medicine, North Carolina State University. A website with details and registration instructions is posted at <http://www.cvm.ncsu.edu/info/ce/zoonutrition.htm> Special sections this year will focus on Primate Nutrition, Food Safety, Fiber and Forages, Vitamins and Minerals; as well as general sessions. Dr. Jay Kaplan of Bowman-Grey Medical School will be the keynote speaker, speaking on "Phytoestrogens and Health: What Can We Learn from Primates? An evening event on 12 December is planned for the general public.

**II International Tapir Symposium**

- 10-16 January 2004 - in Panama City, Republic of Panama. Will bring together a multi-faceted group of tapir experts, including field biologists, educators, captivity specialists, academicians, researchers, veterinarians, governmental authorities, politicians

and other interested parties. Session topics will cover field research, population management, husbandry, fundraising, marketing, governmental regulations, eco-tourism, education, veterinary issues and tapir bio-politics. Visit the Symposium website at <http://www.caligo.com/tapir/> for more information and registration details.

**International Polar Bear Husbandry Conference**

4-7 February 2004 in San Diego, CA. Polar Bear International (PBI) in association with the AZA's Bear TAG are cohosting this conference to be held at the Bahia Hotel on Mission Bay. They are bringing together many of the most experienced and knowledgeable "bear" professionals in the world, including noted scientists, zookeepers, and naturalists representing a broad spectrum of institutions. Information and online registration is now available on PBI's website (<http://www.polarbearsinternational.org>). This includes the invited speaker list (updated monthly) as well as the conference agenda, goals, scholarship information and other specifics. Any questions, please do not hesitate to call our headquarters at (225) 923-3114.

**International Association of Avian Trainers and Educators (IAATE)**

- 18-21 February, 2004 in Toronto, Canada. Hosted by the Toronto Zoo. For more information call (416) 392-6008 or email [kbuckle@sympatico.ca](mailto:kbuckle@sympatico.ca), [hamiltonk2000@rogers.com](mailto:hamiltonk2000@rogers.com)

**IX International Otter Colloquium**

- 4-10 June, 2004 at Frostburg State University, Maryland. Theme is "Otters: Ambassadors for Aquatic Conservation". For more information go to <http://otter.frostburg.edu>

**2004 Gorilla Workshop**

- 25-28 June, 2004 in Calgary, Alberta, Canada. Hosted by the Calgary Zoo. Look for more details and registration information as they become available at <http://2004gorillaworkshop.tripod.com>

**AAV 25th Annual Conference & Expo**

- 16-20 August 2004 - in New Orleans, LA at the Sheraton New Orleans Hotel. For further information call (303)756-8380 or visit [www.conferenceoffice.com/aav](http://www.conferenceoffice.com/aav)

**Post Your Coming Event Here - email to [akfeditor@zk.kscoxmail.com](mailto:akfeditor@zk.kscoxmail.com)**

# AAZK Members and Research Workshop 2003

By

Jan Reed-Smith, Chair AAZK Grant Committees  
Columbus Zoo & Aquarium, Columbus, Ohio

The first AAZK grant program was established in 1980 and has grown from one grant of \$250.00 annually to three of \$1,000.00 available to AAZK members only. In 2002 the two AAZK grant committees (Keepers in Research and the Conservation, Preservation, and Restoration established as a goal increasing the awareness of AAZK's grant programs and assisting members in becoming involved in research or conservation work; the workshop held at the Cleveland National Conference was our first step towards achieving this goal.

The information presented at this workshop will be available in the 2003 AAZK National Conference Proceedings. Several areas of interest were discussed resulting in the addition of a few action items to the committees' goals. These included:

1. The creation of a **Funding Source data base**. This will offer information to AAZK members on Zoological Institutions and their grant programs including: contact name, method of contact, funding range, types of projects funded and their priorities, and who they will fund (i.e. staff only, anyone, etc.). **If your facility has a grant program please send this information to – Kim Shotola, Houston Zoo, [kshotola@houstonzoo.org](mailto:kshotola@houstonzoo.org) or fax 713-533-6755.**

2. The creation of a **Mentor data base**. The mentoring list will offer names of people who have done a certain type of research, research on a specific species, or group of species, that are willing to serve as mentors for people just starting a research project. Mentors will be asked to help get people started by giving them guidance on what has been done, what needs to be done, places to look for this kind of information, etc. A mentor may be asked to help review an initial proposal but will not be expected to become involved beyond this degree. **If you are willing to serve as a mentor please send the following information to Jan Reed-Smith, Columbus Zoo, at [jrsotter@iserv.net](mailto:jrsotter@iserv.net) or [jan.smith@columbuszoo.org](mailto:jan.smith@columbuszoo.org), fax – 616-374-3263. Your name, type of research you have done or participated in, species, email address, phone (if alright with you), and institution.**

The AAZK Member's Research Grant Committee is looking for one additional member. If you are interested please send your name, institution, title, and a summary of your experience to Jan Reed-Smith at [jrsotter@iserv.net](mailto:jrsotter@iserv.net) or [jan.smith@columbuszoo.org](mailto:jan.smith@columbuszoo.org).

Current committee members are:

Members' Research Grant Committee – Jan Reed-Smith, Chair; Susan Margulis, Lonnie McCaskill, Anne Oiler, Beth Pohl.

CPR Grant Committee – Jan Reed-Smith, Chair; Paul Bohaska, Norm Gershenz, Patty Pearthree, Pete Riger, Shelly Roach

The Little Rock Zoo AAZK Chapter is now offering for sale  
*"Eat, Drink, and Go Wild"*

A spiral bound cookbook of recipes, photos, and animal facts.

Eight sections of great tasting ideas!

To order send \$10.00 plus \$4.00 shipping and handling to:

Little Rock AAZK Chapter, c/o Little Rock Zoo  
#1 Jonesboro Dr., Little Rock, Arkansas 72205

For information: Daphne Brock, [debrock@att.net](mailto:debrock@att.net)



## Dolphin Calf Dies at Shedd Aquarium

A Pacific white-side dolphin calf has died five days after being born at the Shedd Aquarium, Shedd officials announced on 3 October. One of the aquarium's Pacific white-sided dolphins, Tique, 18, had given birth to a male calf, but the calf never fully learned nursing skills and died. Marine mammal and veterinary staff had provided 24-hour care to both mother and calf, and Tique was doing well, according to the institution's news release.

The calf was conceived by artificial insemination and was the first such birth of any animal at the aquarium, and the second ever of a Pacific dolphin. The other birth occurred at SeaWorld in Florida. The pregnancy was the second for Tique. She had given birth to a stillborn calf in 1995.

Another Pacific white-side dolphin, Kri, 18, that also was impregnated through artificial insemination last year, gave birth to a stillborn male calf on 1 October. Kri was doing well and would remain under observation, Shedd officials said. Although her pregnancy had progressed normally, aquarium officials knew it would be a high-risk delivery because this was to have been Kri's first calf.

The dolphin and whale habitats at Shedd's Oceanarium were temporarily closed so marine mammal staff could care for the animals, but the habitats reopened on 5 October. *Source: WBBM News Radio 780 online/Chicago, IL*

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## THE ARK IN THE PARK

The Story of Lincoln Park Zoo



## THE ARK IN THE PARK

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MARK ROSENTHAL, CAROL  
TAUBER, AND EDWARD UHLER

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# REACTIONS

## *A Question and Answer Forum for the Zoo Professional on Crisis Management*

*By William K. Baker, Jr., Curator  
Little Rock Zoo, Little Rock, AR*

### Question

What precautions should staff members take in advance of a dangerous animal transfer or shipment?

### Comments

The care and management of dangerous animals in captivity requires specialized skills. This would include animal management, concentration, communication, and teamwork. The same can be said for the transfer and shipping of dangerous animals. Always stay within established procedures and avoid personal interpretation. Examples of this would include: "I know what the procedures are, but this way is faster", or "It has always been done this way." Procedures for handling dangerous animals are usually designed to protect the staff and the animals. If a problem exists, then it should be addressed at the departmental level to effect a change in policy.

### DANGEROUS ANIMALS

1. Animal - Learn to recognize species-specific behaviors and what they mean, (i.e., primary signs of aggression). Also, each individual animal has its own unique personality that will set it apart from other animals in the collection. It's important to review animal and medical records to establish if the animal has any particulars that might affect a move. This would include a history of escapes or problem sedations. In short, know your animal.

2. Technique - The species type will, to a great extent, determine what method is chosen to move an animal. But, the animal history should be taken into account when deciding which technique to use. If the animal has a history of aggression and escapes, then the best choice may be to use a dart rifle for the sedation. For larger specimens that are simply difficult to move, a standing sedation may be an alternative. Another option is the use of operant conditioning to desensitize the animal to the transfer process. In some situations this may even eliminate the need for sedation all together.

3. Equipment - This is probably one of the most overlooked areas when it comes to moving animals. It is absolutely imperative that the equipment be inspected, tested, and repaired before it is used for a dangerous animal. This would include:

A. Inspect the fittings, bolt assemblies, mesh, and weld points on all holdovers and runways that are to be used. Inspect and test all shift doors and guillotines. Pay special attention to wires, pulleys, and counterweights. Make repairs and replace worn locks as needed.

B. Inspect and test manual and hydraulic squeezes. Look for stress points in the metal, tighten all loose parts, and replace all damaged parts with new ones. Lubricate all moving parts and hydraulics. Always make sure that all controls are out of the reach of the animal, and weld sheet steel over obvious gaps that the animal could utilize for contact.



C. Shipping crates should be animal-specific. Crates should be stored properly inside a building or warehouse to prevent weathering. Before the crate is used it should be closely inspected. Tighten all fittings and remove sharp edges from the interior. Use light to your advantage in the inspection process. Check the exterior and interior with a flashlight or close the crate with someone inside to check for gaps. If there are any doubts about the strength or stability of a crate, don't use it!

D. Many shippers and institutions use trailers that have been customized or designed for exotic animals. These are especially popular for hoofstock applications. Always inspect every square inch of a trailer for wear, loose fittings, and safety hazards. Personally, I prefer the double containment of a crate inside of a trailer or in the cargo area of a truck box for safety reasons. But, the important thing to remember is to never use a domestic stock trailer for exotics. It's unsafe, impractical, and downright dangerous.

4. Animal Care - Animals should have access to food and water if they are to be in transit for an extended period of time (more than 24 hours). Expect the water intake to increase in direct proportion to the degree of stress. Always watch for indications of severe stress or myopathy. If possible, a Veterinary Technician and a Zoo Keeper should accompany the animal during transit. It is a good policy to send along a portion of the current diet for the new facility to use in acclimating the animal to a diet conversion. Also, make sure that all paperwork, health certificates, permits, and routing numbers are in order before shipment. Any of these can easily tie an animal up in red tape and increase transit time. Always try to conduct air transfers early in the day to provide a time buffer and avoid heat stress. Send the animal's records if they haven't been sent in advance of the shipment.

5. Crisis Management Precautions - Plan for contingencies, escapes, and injuries. It usually never happens; but it doesn't hurt to be prepared. If the animal has a background of aggression or escapes, it would be advisable to have extra darts or back-up dart rifles ready. Serious consideration should be given to the presence of an armed response in the event that the situation degrades and human life is threatened. This should be done discreetly and without interfering in the actual animal transfer. Transfers should be conducted early in the day before public hours and while other Zoo Keepers are in their respective areas (no sightseers).

## **Conclusion**

Most dangerous animal transfer and transport operations go smoothly with limited risk to animal and staff. But, the staff should always be prepared for the unexpected. The best precautions are to use common sense, check everything twice, and go slowly. Always rely on your instincts and stop if something doesn't look right. Remember to make safety your number one priority. Dangerous animals are just that....Dangerous.

**Next Month:** Do you have any recommendations for preventing human encroachment into a zoological facility?

**If you would like to submit a question for this column or have comments on previously published materials, please send them to AAZK, Inc., 3601 S.W. 29th St., Suite 133, Topeka, KS 66614 Attn: Reactions/AKF**

(About the Author: Since 1985 Bill has been active in the fields of science, zoology, and wildlife management. His education and experience include a B.S. in wildlife management and post-graduate studies in zoology, Lab and Museum Assistant, Shoot Team Leader, ERT Member, Large Mammal Keeper, Senior Keeper, and Zoo Curator at various zoological facilities. His area of research is crisis management in zoological institutions, which draws upon practical experience and training as a Rescue Diver, Hunter Safety Instructor, NRA Firearms Instructor, and Red Cross CPR/First Aid Instructor.)

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# **AAZK Announces New Members**

## **New Professional Members**

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## **Renewing Contributing Members**

Steve H. Taylor, Director  
Cleveland Metroparks Zoo, Cleveland, OH

William H. Disher, Volunteer Observer  
San Diego Zoological Society, San Diego, CA

## **Renewing Institutional Members**

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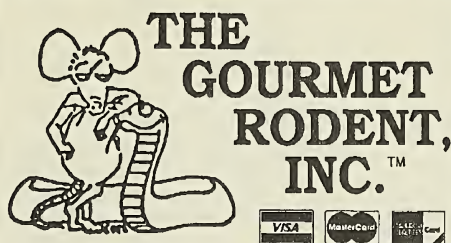
## **FIRST CALL FOR PAPERS**

**IX International Otter Colloquium**  
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The IX International Otter Colloquium will be hosted on the campus of Frostburg State University (MD) on 4-10 June 2004. We are now accepting abstracts for paper and posters sessions at the colloquium. Information and instructions for submitting abstracts and other contact information can be obtained from the colloquium's web site (<http://otter.frostburg.edu>). Please distribute this information to: colleagues with an interest in otter biology, ecology, conservation, veterinary care, and captive management. A considerable portion of the conference will focus on issues related to the conservation of aquatic ecosystems. Consequently, we encourage those with research interests related to aquatic ecosystem management to participate in the colloquium.

A one day workshop focusing on captive issues has been added for June 3<sup>rd</sup>. Please submit abstracts to Jan Reed-Smith at [jrsotter@iserv.net](mailto:jrsotter@iserv.net) or [jan.smith@columbuszoo.org](mailto:jan.smith@columbuszoo.org). The registration cost for this day is \$25.00.

We also are encouraging rehabilitators working with otters to participate, please share this notice with any you know are/have worked with otters.



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# Determining the Effects of Humans on Brown Bears at Alaskan Salmon Streams

Animal care professionals with an interest in bears have a unique opportunity before them to participate in a field study of Alaskan brown bears. The Alaska Department of Fish and Game is conducting a multi-year survey to determine the effect of humans on bears at Alaskan salmon streams; and they are seeking qualified Bear Viewers for the 2004 season.

Groups of five people are needed to provide the research team with Viewers at the appropriate times through the season, volunteers will participate in field trials for four- to six-day periods beginning in mid-June and extending to mid-September. There will be a month-long period from mid-July through mid-August without Viewers. Each person's field time is expected to be about four days. But because of the distances involved, variable weather and tides, the entire journey is planned for eight days.

Volunteer Viewer participants will travel independently to Alaska, join up with their scheduled groups at a predetermined point and remain under the supervision of Alaska Department of Fish and Game biologists for the duration of their camp visit. Once the commitment has been completed, Viewers may want to spend extra time in Alaska on their own.

A total of 75 Volunteer Viewers are sought for the project, and first consideration will be given to full-time zoo employees. This is being done to provide the project research team with viewers possessing experience observing and working near wildlife; and to create an opportunity for those who may not have participated in fieldwork before. Minimum age for participation is 18 years.

The cost of participation will be borne by the individual Viewer participants in the study. When the 2004 season logistics have been firmly established, a final, itemized price tag will be published; but at present the estimated total expense for each Viewer participant could range from \$1,000 to approximately \$1,500. A deposit of \$100 will be due by **20 November 2003**.

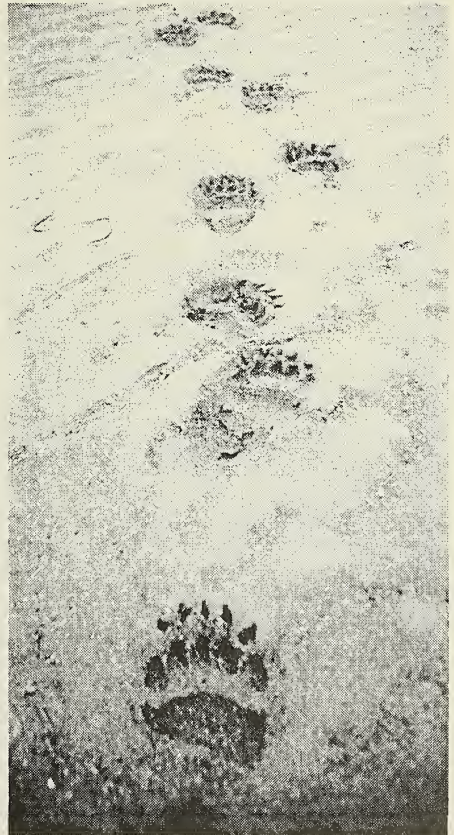
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# Zoo Employees and Wild Animal Liability

By

Brett Bannor, Zoo Keeper  
Zoo Atlanta, Atlanta, GA

In the book *Landscape and Memory*, historian Simon Schama describes an unfortunate incident that occurred over 150 years ago at the London Zoo:

When, in 1852, the first “keeper of serpents,” one Edward Horatio Girling... downed three pints of ale washed down by gin, and blind drunk, began to wave a cobra about, it not unreasonably bit him. Two hours later, at the University College Hospital, he was dead. And while the sensational accident gave rise to a great deal of predictable sermonizing in the newspapers about the drinking habits of the working classes, it was, of course, phenomenally good for the turnstiles through which crowds passed, lining up to view the murderous reptile peacefully curled about his branch behind the glass. (Schama 1995: 562.)

Anecdotes such as this serve to remind us that those who work with potentially dangerous wild animals have an obligation to be careful and clear-headed; obviously Girling was neither.

It is unusual to come across a description of an animal related injury to a zookeeper in a history book such as *Landscape and Memory*. One who wishes to research this particular topic would not normally consult the typical historical accounts. Instead, the most productive source of information on animal injuries to people is judicial case reports. These can be thought of as a special kind of history, the history of lawsuits. Indeed, the legal literature includes several suits involving zoos, aquariums, and the wild animals on display. Some of these cases stand out because the injured party was a zoo employee, or because a zoo worker was actually or potentially involved in the animal's injury to another. This article is an account of such litigation.

The style of this paper is informal; it is intended to acquaint the reader with significant liability judgments regarding zoo employment without delving into all the legal particularities. I have elsewhere presented a more formal look at the development of tort law for keeping captive wild animals (Bannor, 2003). Except where noted, all information comes directly from the published case reports.

## The Wandering Washington Wolf

Personal injury cases involving wild animals have frequently focused on the difference between strict liability and negligence (Keeton 1984:541-42). In other words, if person A keeps a wolf captive and it injures person B, is A automatically liable simply because he kept the wolf, or does it have to be shown that either A or B was at fault?

Often in a wild animal injury case, it is plain that there was negligence on the part of someone. For instance, if A owns wolves, keeps them in a flimsily constructed pen, and one escapes, attacking B as he is jogging through the neighborhood, it is obvious that A is negligent because of his shoddy enclosure. On the other hand, if A has a very secure wolf cage, on posted private property, and B walks right up to the enclosure, sticks his arm within, and is then bitten, it is clear that B's negligence is the paramount cause of the injury, assuming B is a competent adult.

What happens, however, when there is no apparent negligence? What if A takes every reasonable care to keep his wolves secure but one still escapes and harms B who simply is in the wrong place at the wrong time? Neither A nor B seems negligent, so to declare A responsible is to take the strict liability position that our wolf keeper is liable simply because he chose to keep wolves. But is it significant if A was *not* the owner of the wolves, but was merely *employed* to care for them?

It was in a 1904 appellate court case in Washington, D.C. that such abstract reasoning found a concrete occurrence. Having escaped its enclosure at the National Zoo, a wolf left the zoo grounds and wandered onto private property, where it attacked Hannah Jackson. Jackson did not simply sue the National Zoo; she also specifically named Baker, the zoo superintendent, in the suit. Thus it was not just a lawsuit against the Smithsonian Institution, the zoo's management, but also a claim against the person employed to look after the wolves.

In *Jackson v. Baker*, the court clarified the difference between the application of strict liability to an animal's owner, such as the Smithsonian, and the animal's caretaker, such as Baker. Specifically,



since there was no negligence on Hannah Jackson's part, the Smithsonian could be held strictly liable for the accident. Baker, on the other hand, could not be held liable unless there was evidence presented that he was negligent.

The court explained Baker's freedom from liability in this manner: It must be remembered that the regents of the Smithsonian Institution have power and authority to send such animals to the park as the regents may deem proper. It is necessarily the duty of the superintendent of the park to receive them. He has no discretion in the matter... therefore the keeping of the animals is his lawful duty and obligation, and the law will not hold him responsible for an injury inflicted by an animal, except the injury has been occasioned through (his) negligence.

In fact, no such evidence of negligence by Baker or by anyone else was presented in the record. He was thus off the hook. The Smithsonian, on the other hand, did not have the defense of claiming lack of negligence. The wolf belonged to them; under a theory of strict liability they were liable for its actions.

#### August Bormann's September Injury

August Bormann was an employee of the City of Milwaukee, Wisconsin in the 1890s. At the time, the city maintained an animal collection at the city's West Side Park. One of Bormann's duties was caring for deer and elk that were kept together in an enclosure. It was on September 29, 1893, that Bormann entered the exhibit and was, in the terse words of the *Bormann v. City of Milwaukee* case report, "attacked and seriously and permanently injured and wounded by said animals."

On appeal, the case went all the way to the Supreme Court of Wisconsin, where the decision centered on the concept of *assumption of risk*. This is defined as the position taken in a negligence suit that the injured party voluntarily exposed himself to a potentially dangerous situation even though he knew the hazard existed (Gifis 1996:36).

Wisconsin's highest court accepted Milwaukee's assumption of risk argument and ruled that Bormann had no justifiable claim. The opinion declared:

The plaintiff... must conclusively be presumed to know the habits and propensities of such animals. With such knowledge, or presumed knowledge, he voluntarily entered upon the service... The rule is familiar that a servant assumes the ordinary risks incident to the business in which he engages.

To the *Bormann* court, then, no consideration was due any notion that perhaps a second keeper should have been present. Nor was it brought up that use of a shift pen could allow the keeper to safely access the main pen free from direct contact with the elk. Bormann assumed the risk by being a Milwaukee employee and going in with the animals, and that was that.

The facts and the decision in the *Bormann* case were in many respects repeated nearly six decades later in the 1965 case of *Oklahoma City v. Hudson*. Lynn Hudson was a zookeeper at the Oklahoma City Zoo. One day he was cleaning the zoo's lion exhibit. The big cats, of course, were off display in a holding unit. Suddenly the lions knocked open the door separating the exhibit from the holding and severely mauled Hudson. He was quite fortunate in that he survived, and as a result of the accident he instituted a lawsuit against the city seeking \$57,300.00 in damages.

A lower court issued judgment in Hudson's favor; the city appealed, and the case went before the Oklahoma Supreme Court. As in the case of *Jackson v. Baker*, the key legal question was whether strict liability would be imposed. The lower court ruled that Oklahoma City was strictly liable, since they owned the lions. The state's highest court, however, reversed this decision and granted the city's motion for a new trial. In distinguishing *Hudson* from other Oklahoma precedents in which strict liability for owners of wild animals had been imposed, the state supreme court noted that Hudson was not a visitor to the zoo, but rather he was a zoo employee. Thus, because Hudson had assumed the risks inherent in zookeeping, he could not recover on a theory of strict liability. Only if he showed that Oklahoma City was negligent and that he was not could he win his suit. Hudson had failed to do so in the original trial; he alleged that the doors were faulty but under oath admitted that he was not entirely positive he had latched the doors shut.

#### Big Gibbon Bite in the Big Easy

It is the most natural thing for a zoo employee to desire: to take a friend behind the scenes at the workplace. Perhaps there is nothing wrong with this if the zoo authorities have no objections and if safety concerns are not compromised. However, all zoo and aquarium personnel should be aware of the 1978 case of *Normand v. New Orleans*, for it serves as a cautionary tale.

One evening, Frank Ercole, an employee of the Audubon Park Zoo in New Orleans, realized he had earlier forgotten to turn off the water to a pool in the zoo's primate area. He drove back to the zoo with his brother, also a zoo employee; his neighbor, Cindy Normand; and her two-year-old son Mark. Arriving at the zoo, Ercole discovered that someone else had already turned the water off. At this point, he decided to take Mrs. Normand and Mark to the service area for the primate units. Ercole did this even though he was not a primate keeper. Furthermore, it was past closing time and the zoo had a policy forbidding employees from bringing visitors into the park after hours. Finally, employees were not allowed to take visitors into certain areas—such as the behind the scenes primate area—at any time.

Mrs. Normand held her toddler son in her arms as Ercole led them through the narrow corridor behind the primate cages. Ercole apparently cautioned little Mark to keep his hands to himself. Two year olds are unlikely to heed such advice when in the presence of unfamiliar stimuli, and Mark would prove to be no exception. He pointed at a gibbon; the ape in turn grabbed his hand and severely bit it.

Ercole was fired after the incident, and Mrs. Normand sued the city and the Audubon Zoological Society for the injury to her son. When her suit was dismissed by the local district court, she appealed to the Louisiana Fourth Circuit.

The key issue raised was the applicability or lack thereof of master-servant law. This is a legal manifestation of the relationship between employer and employee that holds the employer liable for the actions committed by the employee while he is acting within the scope of his employment (Gifis 1996: 309). The court's task, then, was to judge whether Ercole's conduct was a part of his job, in which case the city would be liable for Mark Normand's injuries under strict liability, or if Ercole's actions were not employment related, in which case the city was not liable and the suit would be dismissed.

Not surprisingly considering the circumstances, the city prevailed. In its opinion, the court wrote: Although the employee... originally returned to the zoo to perform an employment task, his conduct in taking a child beyond the guard rail, into close proximity with wild animals, was such a significant and unpredictable deviation and departure from his employment duties and was so unrelated to service of the employer as to remove the conduct from the scope of his employment. The conduct was more properly characterized as motivated entirely by personal considerations... the Commission was not responsible...

Courts typically restrict their holdings to the facts of the case before them. Accordingly, there was no examination of similar hypothetical situations. What if Ercole had actually been a zookeeper who worked with the primates? What if zoo employees were not expressly forbidden from taking visitors into the zoo after hours in general or into the primate service area in particular? Had these been the facts, would Mrs. Normand have prevailed under the master-servant doctrine?

Here, these questions are asked rhetorically. The important lesson for zookeepers is that before we treat friends or acquaintances to a look behind the scenes at our workplace, we must know whether zoo management has granted approval for such acts.

#### The Sooner Bathhouse Bear

Perhaps the strangest case in the annals of animal law occurred in Oklahoma in 1938. It fits the scope of this article not because a zookeeper or other employee was involved, but because a visitor saw fit to try to assume the duty of a zookeeper.

The city of Mangum, Oklahoma, maintained a small zoo adjacent to its municipal swimming pool. Included in the collection was a bear pit surrounded by a rock wall; this enclosure could only be accessed from the bathhouse of the pool. One day the bear escaped from its pit. Bill Bolen, a visitor to the park with no connection to the city or the zoo, decided to help secure the animal. He described himself as a friend of the bear, which helps explain the rather bizarre actions he took. Incredibly, he first tried to push the bear over the rock wall and back into the pit. The bear snapped at him, so Bolen quickly abandoned this idea. He instead proceeded to lead the bear through the bathhouse with the intention of taking it through the access door and back into its pit. Going through the bathhouse, Bolen and the bear encountered a boy named Earl Brownlee who had come out of the pool and was about to get dressed. The bear bit the boy's leg and held on to it for several minutes; only by beating the animal with a hammer were others able to free Earl Brownlee from its grasp. Young Brownlee's leg required extensive surgery and he was on crutches for weeks.



In District Court, a judgment was entered in favor of Earl Brownlee and requiring the city to pay \$1,100.00 for his injuries. The city appealed, and so the Oklahoma Supreme Court heard the case of *City of Mangum v. Brownlee*. Attorneys for the city argued that the municipality was relieved of its liability because of the actions of a third party. That is, they argued that Bill Bolen's conduct caused the accident and the city could therefore not be held at fault.

The court rejected this line of reasoning. It noted that the city had a duty to perform the bear retrieval task itself, but declared that the mere fact of Bolen's effort to lead the bear back to its exhibit did not in any way render the city immune from a resulting lawsuit. Thus, the judgment for Brownlee stood.

A comparison between *Normand v. New Orleans* and *Mangum v. Brownlee* is instructive. Notice that in the New Orleans case, the city was held not liable because a zoo employee was behaving in an irresponsible manner when the injury occurred. By contrast, in *Mangum* it was not a zoo employee but a zoo visitor who engaged in inappropriate actions contributing to the injury—and in this case the city did incur liability. Put simply, these results suggest that absent other legal considerations, courts will apply a higher standard for zoo employee conduct than for zoo visitor conduct. This hardly seems surprising.

### The Pittsburgh Shark and the Volunteer

A recent case considered an injury to a zoo volunteer. Nancy Sakach was a volunteer assistant in the dolphin training program at the Pittsburgh Aqua Zoo. Most of her duties did not involve direct contact with the animals. She would bring supplies to the dolphin training area, clean up after training sessions, and keep records. She did, however, have one task that required her to touch dolphins. Under supervision of the dolphin trainer, Sakach brushed a male South American river dolphin as this marine mammal reclined on a ledge next to the pool.

One day in March 1990, Sakach was thus engaged as the dolphin lay on its back. Sakach then stood up, at which point the animal flipped over and grabbed her hand, biting off the tip of a finger. The volunteer sued for \$50,000.00 in damages.

The Court of Common Pleas for Allegheny County entered a verdict in Sakach's favor. However, in *Sakach v. City of Pittsburgh* the city won the case on appeal. While the lower court relied on theories of negligence and strict liability in ruling in favor of the volunteer, the appellate court accepted the city's contention that it was immune from liability for a suit such as this one.

Key to the decision was a Pennsylvania statute that read: Except as provided in this subchapter, no local agency shall be liable for any damages on account of any injury to a person or property caused by any act of the local agency or an employee thereof or any other person. This is an expression of the so-called doctrine of sovereign immunity, which holds that the government or sovereign cannot be sued without its own consent (Gifis 1996: 479).

In granting this immunity, however, the Pennsylvania law provided exceptions under which the City of Pittsburgh and other governments *could* face liability suits. One such exception declared that liability could be imposed in cases involving animals that were:

...in the possession or control of a local agency, including but not limited to police dogs and horses. Damages shall not be recoverable... on account of any injury caused by wild animals, including but not limited to bears and deer...

To clarify, then, this meant that a municipality in Pennsylvania could be sued if a police dog escaped and bit someone. On the other hand, if someone driving on a Pennsylvania road hit a deer, he could not sue any governmental entity for damages to his car.

The question thus arose in this case: is a dolphin in a public aquarium more like a police dog, an animal belonging to a local agency, or is it more like a deer crossing the highway, a wild animal for which damages were not recoverable? The *Sakach* court accepted the latter position, that the Pittsburgh dolphin was wild, and thus the city was immune from a lawsuit for its damages.

One could certainly argue this interpretation of the statute. It seems quite clear that the very reason the law mentioned bears and deer as examples of wild animals, instead of, for instance, tigers or elephants is that bears and deer are native to Pennsylvania while tigers and elephants are not. Thus, the law as written seemed to have contemplated injuries or damages caused by wild animals that belonged to nobody, not captive wild animals such as would be found in a zoo. Indeed, if one

*Continued on page 476*

# The Water Column

By

*Dan Conklin, Senior Biologist, Florida Aquarium  
Bruce Elkins, Curator of Waters, Indianapolis Zoo  
Kevin Shelton, Associate Curator, Florida Aquarium*

## Materials for Use in Aquariums

Most aquariums on the market are either glass or acrylic, held together with silicone sealant or welds. Both these materials are proven workhorses in the aquarium industry, but what about other materials? What can you use for the various fittings, filtration pieces, even furniture for your tank? I want to talk about the pros and cons of various materials this month.

So, we all know that glass is a fairly inert material that as a long lifespan in both fresh and sea water. It is strong, clear, and resistant to most chemicals. On the other hand it is heavy for its strength, does not have good sheer strength and hence is prone to breaking. It also cannot be repaired in most cases and does not polish (to remove scratches) easily. It also has to be tempered or laminated to protect from shattering into dangerous large pieces, and this lamination is prone to clouding between the panes of glass. For these reasons many aquarium tanks are now made of acrylic or Plexiglas™, but acrylic is not without its drawbacks as well. Acrylic is lighter in weight than glass for the same strength. It can be molded into numerous shapes, and is relatively easy to fabricate by welding or solvent gluing. Acrylic can be polished to remove scratches. It has similar chemical resistances to glass, although it will not stand up to strong acids or bases as well as glass. Acrylic does tend to bow under stresses and is not used as a structural material because of this. Another factor is it can warp when exposed to high humidity conditions. Try using a piece as a tank lid and you will notice it begin to bow upwards along the edges. If you flip it over it will then bow in the opposite direction.

So what about other materials?

Wood has long been used around aquariums. It has good structural strength in the short run but there is its natural tendency to rot (being of organic origin) to deal with. Certain species of wood will last as exhibit furniture better than others, of course. Cypress comes to mind since we have had a stump in one of our freshwater exhibit for 10+ years now. Softwoods, such as pine, will not last as long as the hardwoods but are generally cheaper to purchase. Other than exhibit furniture we have used wood as temporary holding tanks once it was coated with several layers of two part epoxy. Most of the time we have used wood for stands and other support structure due to its ease of use and inexpensive price tag. One word of caution with using wood around exhibits; most pressure-treated lumber (green lumber) can be toxic to animals, especially aquatics, and should not be used. While pressure-treated lumber will last longer in wet conditions, it should only be used for support structures and not in direct contact with exhibit water.



An alternative to wood for support structures is the new plastic lumber that is entering the market. It is not as strong as natural wood, it tends to bow more, but it can be fabricated much the same as natural wood. It will not rot, and has similar chemical resistances as acrylic. It is more expensive than wood and is not yet as readily available. We began using it about a year ago and are slowly replacing all the wood structure with this material.

A third choice is fiberglass. Fiberglass is another old standby for the aquarium industry. It is very inert, has very high chemical resistance, and is very strong for the weight. Fiberglass can be used in direct contact with exhibit water and is often used for larger diameter pipes since it is stronger by weight than PVC pipe. Fiberglass can be molded into almost any shape. It can be bought in hundreds of pre-made shapes and sizes from piping to I-beams, floor grate to flat sheet. Fiberglass's main drawback is it is difficult to work with. Even simple drilling will create a very irritating dust. Joining two pieces of fiberglass (if not done with bolts or screws) requires grinding the surfaces to raw material, then applying epoxy glue and holding the pieces together until the epoxy sets. The epoxy itself has to be mixed with a hardener and if you use too little, the epoxy won't harden in a reasonable time. If you use too much hardener it will set before you are finished applying it. Both situations will require starting over, even if you don't have to throw out the pieces you are trying to join. Another problem with fiberglass is that it will require a top coat of epoxy to keep the glass fibers from being irritating to the skin. Raw fiberglass naturally sheds microscopic splinters of glass that will lodge in any unprotected body area, be it human or fish.

In my opinion metal should be avoided in any aquarium application. Metals run the gambit from being toxic such as copper piping, to simply being too expensive as in high quality stainless steel. Mild stainless steel (316) is relatively inexpensive and can be used for longer periods of time for freshwater applications, but it will not last nearly as long in seawater environments. Iron and mild steel will rust so fast it is not worth the effort to build with it. Galvanized steel will last a little longer; at least until the coating are compromised, but galvanized coatings can lead to zinc toxicity problems when exposed to exhibit water. Of course there are applications where metal cannot be replaced. Chillers and heating plate exchangers will have to have some metal to allow the transfer of heat in them. In these cases, I opt for units with titanium coils or plates. Titanium is very expensive but has the best lifespan and chemical resistance available in these units.

A quick reminder: The authors of the Water Column are always willing to answer any questions you might have. They can be about filtration systems, water chemistry, or aquatic life. If we don't know, we will find out for you! We also welcome feedback from readers about previously published columns. Questions and comments may be submitted to us by email at:

Dan: [dconklin@flaquarium.org/](mailto:dconklin@flaquarium.org/)

Kevin: [kshelton@flaquarium.org/](mailto:kshelton@flaquarium.org/)

Bruce: [belkins@indyzoo.com/](mailto:belkins@indyzoo.com/)

Or by mail at: Kevin Shelton, The Florida Aquarium, 701 Channelside Drive, Tampa, FL 33602.

# Chapter News Notes

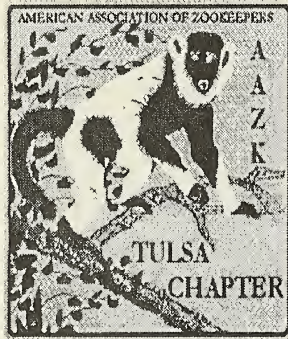
## Tulsa AAZK Chapter

Current officers are:

President..... Pamela Bingham  
Vice President..... Jessica Scallan  
Secretary..... Christy Brigham  
Treasurer..... Mike Connolly  
Liaison..... Aaron Goodwin

Officer elections were held in December for the following year. Jesse Gilbert was elected and served as President from January to June. He accepted a position in Texas so a new election was held to complete his term. We miss his enthusiasm.

Last year proved to be a very busy one. We volunteered in several zoo-sponsored events including: Member's Night, Zoofari, HallowZooeen, and Docent Graduation.



Fundraising events include: Valentine-grams, vending machine revenue, and manning the root beer trailer at the local Oktoberfest celebration. In addition, our "Keeping up with Keepers"

program got off the ground. The program has proven to be both fun and educational for the participants and keepers, as well as an excellent fundraiser. We held the first Zoo Revue, a talent/variety show hosted, produced and consisting of zoo staff. (Great idea, Jess!) And, of course, we can't forget the Zoo Rhythm Keepers, a traveling percussion style troupe. We are overflowing with creativity and talent.

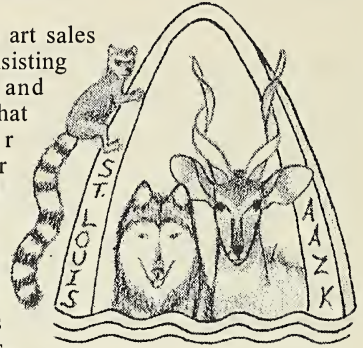
We sent funds to: Idea Wild \$330.00, Defenders of Wildlife \$100.00, Desert Tortoise Project \$200.00, and the International Rhino Foundation \$1,500.00.

Check out our Chapter website at:  
[www.tulsaaazk.org](http://www.tulsaaazk.org)

## St. Louis AAZK Chapter

Wow, what a year! This has been the first year St. Louis has had an AAZK Chapter in over 10 years but I think we accomplished a lot—for rookies. Our Chapter consists of keepers from the St. Louis Zoo and the Wild Canid Research and Survival Center.

We had two art sales this year consisting of keeper and animal art that together raised over \$300.00 and helped get our name out into the community. The zoo was generous enough to give us



the profits from the fountains on grounds with the condition that we pick the change out ourselves, of course. This has proven to be a huge gift that has allowed us to pursue more than we dreamed.

Bowling for Rhinos was a huge success! Keepers, volunteers, staff, and friends all joined together for a fun-filled night that raised \$1308.71.

Several keepers from the St. Louis Zoo have been volunteering at the WCSRC to assist with wolf captures (for yearly vaccines, enclosure changes, etc.). This partnership is sure to be a winner!

September 20, 2003 kick-started our cell-phone recycling program. Recycling cell-phones saves coltan, a mineral that if not recycled would have to be mined which destroys valuable habitat. Proceeds will benefit BOS-USA (Balikpapan Orangutan Society).

We would like to thank the zoo for all of their guidance and support are looking forward to another great year!

--Sarah Christeson/ Treasurer, Liaison,  
BFR chairperson

## Little Rock AAZK Chapter

The Little Rock AAZK Chapter is now offering a spiral bound cookbook filled with recipes, photos, and animal facts. To order send \$10.00 plus \$4.00 shipping and handling to the Little Rock AAZK Chapter, c/o Little Rock Zoo, #1 Jonesboro Dr., Little Rock, AR, 72205.





# Book Review

## **The Giraffe: Its Biology, Behavior and Ecology**

By Anne Innis Dagg & J. Bristol Foster

1976, reprinted in 1982 with updated supplementary material

ISBN 0-89874-275-7

Originally published by Van Nostrand Reinhold, New York

Reprinted by Krieger Publishing Company, Inc, Krieger Drive, Malabar, FL 32950

Hardback. 232 pp. \$34.50

*Review by Laurie Bingaman Lackey, Wildlife Biologist  
International Species Information System (ISIS)  
North American giraffe studbook keeper*

This remains the classic giraffe reference, including not only the authors' extensive field research, but a comprehensive overview of other researchers' work.

The history of man's interactions with giraffe is well documented, beginning with the ancient Egyptians in 2500 B.C., Rome in 1215, China in 1600, England in 1805 and North America in the mid-1850s. "A strange and marvelous beast, the like of which we had never seen before", wrote Melchior Lorch in about 1597. More modern treatment of the species was not as encouraging, as the arrival of modern weapons in Africa was devastating to the species. "The death-knell of the giraffe has tolled. This wonderful and harmless animal is being completely annihilated!" (Schillings, writing of South Africa in 1907).

The book begins with a country-by-country analysis of distribution, including a discussion of game management and cropping, a relatively new idea in the early 1960s and one that has become a reality with some species, although not giraffe.

A discussion of taxonomy concludes "Without a thorough study, any attempt to divide the species into further races or to telescope several races into one would only add further confusion to the already confused nomenclature." This confusion continues nearly 35 years later. Dagg also studied the spot inheritance of giraffe at the Taronga Zoo and concluded that the numbers, areas, and shapes of the spotting were all inherited.

Other subjects covered include a discussion of giraffe, okapi, and fossil giraffids, growth rates and measurements, and extensive treatments of feeding ecology and the biomechanics of locomotion. Sections on social groupings, reproduction and population structure are sprinkled with useful information ranging from identifying giraffe by neck spot patterns to a generic description of the calving process and the composition of colostrum and milk.

Appendices include detailed summaries of giraffe taxonomy, anatomy and physiology, skeletal structure and energy relationships. The anatomy section includes an organ-by-organ discussion, including (for example) a table of the lengths of the alimentary tract for various ages of animals.

The section on the vascular system includes a re-telling of the first attempts to study the changes in blood pressure associated with giraffes bending their heads down to drink.

A supplementary section includes new material included in the second edition of the book. In an update of the populations in the various countries, Angola and Uganda report slaughter due to political instability. Zaire reports that poaching is not a serious problem, due to the belief that leprosy will affect anyone touching a giraffe skin. Other countries report increasing and stable populations

A bibliography containing over 700 references rounds out an enormous amount of data.

This is not a book for light pleasure reading, but offers an amazing amount of detailed information from many sources otherwise difficult to assemble. i.e., Backhaus (1959) reported that after training a captive animal by offering it food in color-marked containers, it could distinguish red, orange, yellow, yellow-green, and violet. Hall-Martin (1977) provides data whereby it is possible to estimate the body weight of a giraffe fairly accurately if linear body measurements are known.

### **Whales, Dolphins, and Porpoises**

By Tony Martin, 2003

ISBN #: 2003, 0-89658-579-4

Voyager Press, Inc., 123 North Second Street,  
P.O. Box 338, Stillwater, MN 55082 U.S.A.

95 pgs. Hardback \$24.95

*By Heather DeCaluwe, Lead Keeper Mammals  
Nashville Zoo at Grassmere, Nashville, TN*

After 25 years of research, Tony Martin is truly passionate about whales, dolphins, and porpoises and manages to transmit this passion to the reader. His goal is to "inform, explain, excite and inspire," and this he does. The book is essentially broken into two sections. In the first he explains the important characteristics that make whales, dolphins, and porpoises unique. In the second part Martin goes into a bit of detail about each of the cetacean families. Finally, at the end he supplies us with a "Fact File" listing the Latin name, common name, and range of each species.

What make this book quite wonderful are both the pictures and interesting personal details. Martin adds entertaining side comments, ranging in topic from the poor quality of whale breath to fashion trends in humpback whale music. While the book is not full of hard facts it is very interesting, informative, and easy to read. There is a strong conservation message running throughout the book that leaves you wanting to take up the fight to save these beautiful animals, especially the Chinese River Dolphin, which is dangerously close to becoming the first cetacean made extinct by human activity.

As a Zoo Keeper I found the book quite informative, providing general information about each species. I would use this book as a tool to introduce people of all ages to the wonderful world of cetaceans and to help make them aware of the great current need for conservation actions. The captivating photographs and simplistic writing style make it suitable for interested learners of all backgrounds. It would be a great addition to any zoo library or coffee table.



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# Effects of an Environmental Enrichment on the Behavior of Captive Pygmy Goats (*Capra hircus*)

By

Paul S. Vialpando and Paul J. Kulkosky

Department of Psychology

Colorado State University-Pueblo

Pueblo, CO

## Abstract

There have been several efforts to address the issue of behavioral enrichment of captive goats and other zoo animals. Previous attempts, such as adding novel objects to specific enclosures, have been shown to reduce stereotypy and other “zoo behaviors.” In this study, a perforated plastic ball containing food was introduced to an enclosure of pygmy goats (*Capra hircus*), and changes in their behaviors were quantified. Behaviors of pygmy goats ( $N = 8$ ) housed at the Pueblo Zoo were individually observed with an instantaneous time-sampling ethological technique. An ABA reversal design was used, in which each goat was observed for 10 min. in a pre-control phase (A), followed immediately by the introduction of a Boomer Ball® (B phase), and concluding with a 10 min. post-control phase (A). The introduction of the Boomer Ball® significantly reduced observed incidence of feeding and increased both locomotion and sniffing ( $ps < 0.05$ ). It was concluded that the presentation of the Boomer Ball® temporarily reduced ingestion and increased exploratory behaviors in captive pygmy goats. This technique can be used in the future to ameliorate environmental conditions, and improve husbandry in captive pygmy goats.

## Introduction

Environment enrichment refers to the practice of enhancing the quality of life by providing a stimulating environment for the optimal psychological and physiological well being of a captive animal (Shepherdson, 1998). An enriched environment functions to give animals an environment that mimics a more natural and familiar setting (Flint & Murray, 2001). Several methods exist for environmental enrichment, including introducing manipulable objects into enclosures, and scattering and hiding food. These enrichments have been shown to reduce stress, aggression, stereotypy, and other abnormal behaviors that are found in captive animals. Furthermore, animals provided with a more stimulating environment generally have better learning abilities and more complex brain structures (Widman, Abrahamson, & Rosellini, 1992).

Previous research on environmental enrichment in zoos and on farm animals has indicated that many captive animals, including goats, are still motivated by their natural tendencies. Goats, like many other animals, appear to need to exert some control over their physical environment (Appleby, 1995; Shepherdson, 1998). Researchers have developed methods for giving animals environmental control, while increasing unpredictability and decreasing boredom, by letting them “work” for food rather than just giving it to them on a plate (Tudge, 1991; Shepherdson, Carlstead, Mellen, & Seidensticker, 1993). Tudge (1991) suggests that many animals prefer to work for food because it gives them a feeling of achievement when the food reward is given. In addition, Shepherdson et al. (1993) tested this concept on leopard cats and found a reduction in aggression in the cats that had to search for and find their own food.

Although environmental enrichment has primarily been tested on carnivores and primates, Smith (1993) explains that ungulates, such as goats, can also benefit from enrichment opportunities. Further, researchers Flint and Murray (2001) used enrichment techniques to study changes in behaviors in feedlot goats. These researchers created a mound for goats to climb, and pipes and containers were offered to them to manipulate. The goats that were housed in these enriched structures grew at nearly twice the rate and were less aggressive than the goats housed in a typical feedlot enclosure. Flint and Murray (2001) suggest that the difference in goat size is due to a reduction in agonistic behavior and stress. The enriched environment reduces stress and boredom, thus allowing animals to better utilize their time for feeding and development.

In addition to feedlot goats, goats that are housed in zoo enclosures, may also experience stress and boredom due to lack of space and bareness (Appleby, 1995). This is due to the fact that wild goats' natural environment consists of heterogeneous mountain and valley grasslands in which they actively browse from one pasture to the next (Hinch, & Lynch, 1997). It would make sense then that captive goats, like other wild animals, need a stimulating and changing environment to grow and develop properly. Environmental methods used to counteract habitual behaviors among goats include providing them with trees, logs, earthen mounds, and other materials to explore and climb (Hinch, & Lynch, 1997). Furthermore, manipulative and novel objects, or "toys," including pipes, plastic drums, and balls, have also been used in goat enclosures (Flint, & Murray, 2001).

Novel objects, such as balls, have been widely used in the enrichment of many different animal species, especially primates (Baer, 1998). These balls, and other objects, have been shown to stimulate exploratory, investigative, and other manipulative behaviors (Baer, 1998; Mellen, Hayes, & Shepherdson, 1998). Previous demonstrations using novel objects have also revealed an increase in animal activity as well as decreased levels of abnormal behaviors. Increased activity may further counteract obesity and musculoskeletal deterioration, in addition to providing animal caregivers (e.g., veterinarians) with the ability to better monitor health anomalies (Baer, 1998). Signs of disease and other injuries are more apparent in active animals, thus giving their caregivers an early indication of health problems.

In this study, a commercially available enrichment device, the Boomer Ball®, was used to determine if a change in the behavioral display of pygmy goats would occur. Previous studies of environment enrichment using such balls have mainly been tested on felids, primates, and other hunting animals (Mellen et al., 1998). The current study assesses whether the Boomer Ball® is also an effective novelty for enrichment in pygmy goats. In addition, the experiment will test whether goats prefer to work for their food rather than eat from portions given *ad libitum*. The goats must actively move the ball for the alfalfa pellets contained inside the ball to be dispersed through the holes. It was hypothesized that presentation of the Boomer Ball® would significantly change the behavioral display by increasing exploratory behaviors among the captive goats.

## Method

### Subjects

Eight different pygmy goats (*Capra hircus*), one male and seven females, were the subjects for this experiment. Their ages ranged from approximately two to 15 years.

### Apparatus

The eight observed pygmy goats were housed in the same zoo exhibit at the Pueblo Zoo (Pueblo, CO). In addition to the eight observed pygmy goats, the zoo enclosure also housed two other pygmy goats, two cashmere goats (*Capra hircus*), two pygma goats (*Capra hircus*), three jacob sheep (*Ovis aries*), and one navajo-churro sheep (*Ovis aries*). Therefore the enclosure housed a total of 18 farm animals when observations were taken.

The outside exhibit in which the farm animals were housed measured 77' 3" L (23.55 m.) x 22' 8.5" W (6.92 m.) x 3' 9" H (1.14 m.). The hard dirt floor is covered with scattered straw, alfalfa hay, and grass hay provided *ad libitum* as feed. The exhibit consists of three inner enclosures, two of which are roofed in order to give the animals some shade. A single tree grows inside the exhibit, along with three large scattered branches. A large wooden wagon structure, and 10 large wooden trunks are also available for climbing and sitting. Two plastic food trays, one metal water tray, and two feeding troughs are also used in the exhibit for *ad libitum* feeding and watering purposes. The exhibit is enclosed with a wood and wire fence so that the animals can be easily viewed, and access to the exhibit is gained through a gate in the front of the exhibit.

A popular ball used in many environment enrichment studies, called a Boomer Ball® (Boomer Ball, Inc., Grayslake, IL - 888-858-9529), was used in this study. The hollow plastic Boomer Ball® (25.4cm (10 in.) diam., 1.06kg (2.34 lb), 0.32cm (0.13 in.) thick sidewalls) has six small holes which allow insertion of food, pebbles, bells, and other small objects. Three of the holes are approximately 1 in. (2.54 cm.) in diameter and the other three holes are 0.5 in. (1.27 cm.) in diameter. In addition, the holes can also be covered with screw-in plugs which prevent objects from escaping. The hollow Boomer Ball® was filled with two cups of alfalfa pellets before each experiment (total of 18 cups).



*Procedure*

A within-subjects design was employed in the measurement of the behavior of the eight pygmy goats. Conditions were controlled with an ABA reversal design in which each goat was first observed in a 10 min. pre-control baseline condition (first phase A). This was immediately followed by an additional 10 minutes of observations following the introduction of the Boomer Bal® with food (experimental phase B). Finally, the ball was removed and 10 additional minutes of observations were taken in the post-control (second phase A) condition.

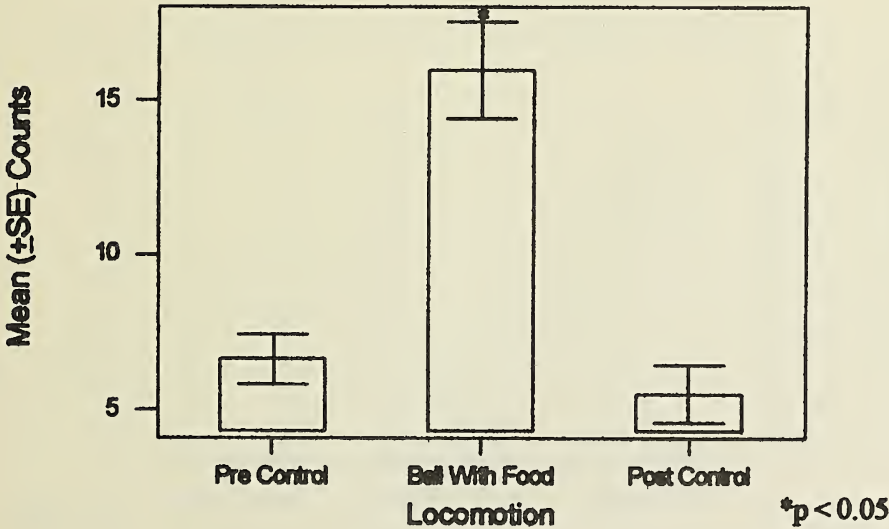
Each pygmy goat’s behaviors were individually observed and quantified using an instantaneous time-sampling ethological technique taken from Glazner, Cannon, and Kulkosky (1988). The observations were taken during a tone-cue interval of 0.6 sec., with a fixed interobservation period of 15 sec. Since each phase was measured for a total of 10 min., a total of 40 observations per phase were recorded. The classes of behaviors included feeding (holding, biting, and chewing food), locomotion (body movements across space), and sniffing (holding nose to object and rapidly ventilating). Other behaviors observed included standing, grooming, resting, defecation, licking, drinking, and aggression. These latter behaviors were combined into a single “other” category to simplify analyses.

Each pygmy goat was randomly chosen before taking observations, and only one goat was observed per day. The experiment was conducted between 3 November 2002 and 29 November 2002 with temperatures ranging from 42.8 to 69.8°F (6° to 21°C) All observations were taken between 1220-1400 hr. In addition, the goats are fed six flakes (bunches) of alfalfa and two flakes of grass hay each day between 0900-1000 MST.

All data were analyzed with repeated measures analyses of variance, followed by Duncan’s multiple-range test at an alpha significance level of  $p < 0.05$ .

**Results**

Mean ( $\pm$  standard error, SE) counts of locomotion in the eight observed pygmy goats showed a significant increase in phase B,  $F(2, 7) = 29.02, p < 0.05$  (Figure 1).



**Figure 1.** Mean ( $\pm$  standard error, SE) counts of locomotion behavior of goats in the pre-control (phase A) condition, experimental (phase B) condition, and post-control (second phase B) condition.

However, Figure 2 shows a gradual reduction in these behaviors in the latter half of phase B. Mean sniffing counts were also significantly greater in phase B,  $F(2, 7) = 11.87, p < 0.05$ , than in both the pre and post-baseline phase A conditions (controls) (Figure 3).

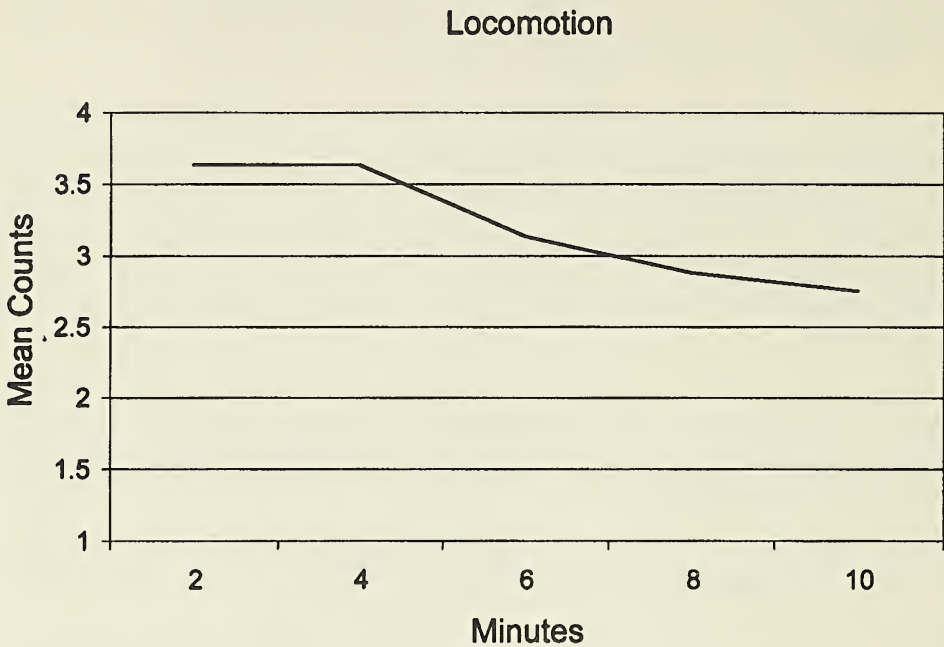


Figure 2. Mean counts of locomotion in the ball with food condition (experimental phase B), across 2 min. intervals.

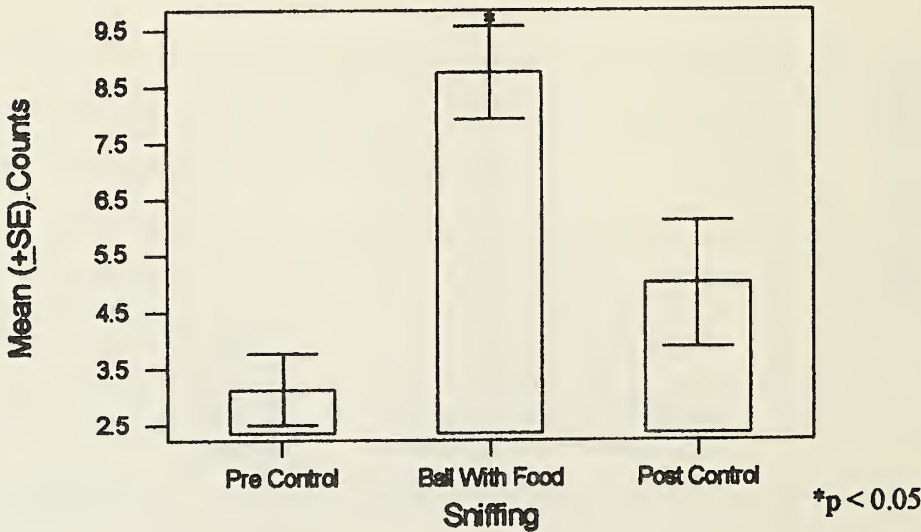
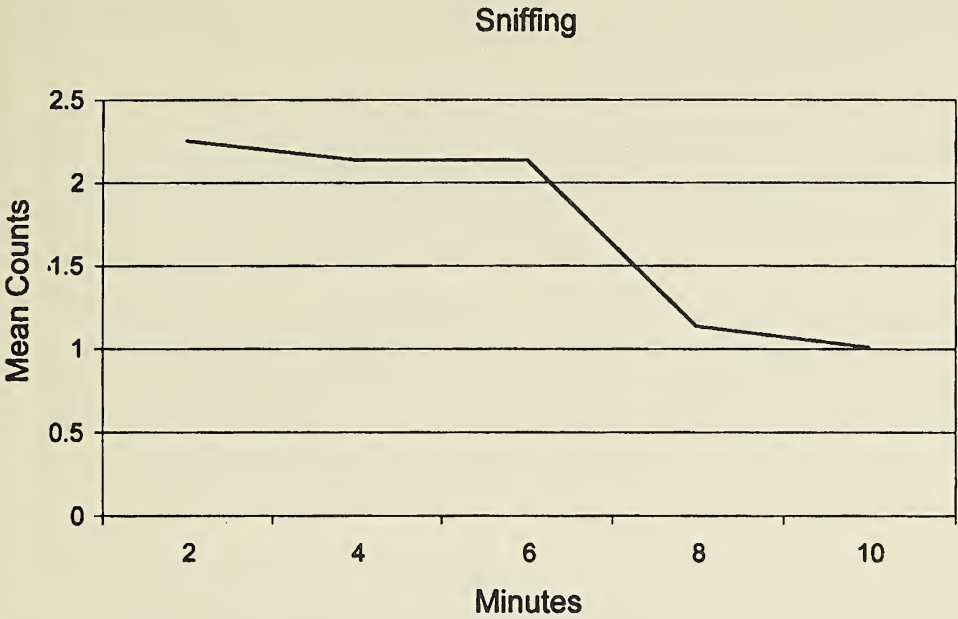


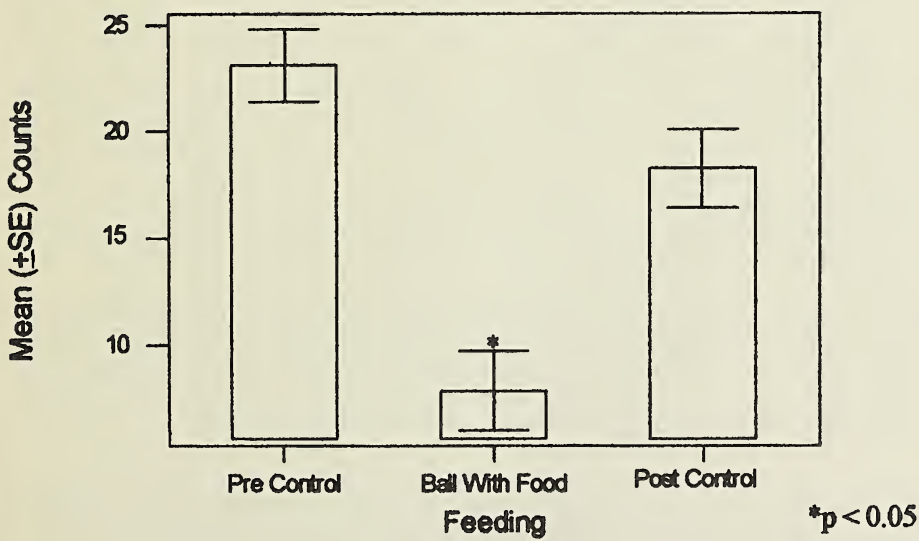
Figure 3. Mean ( ± SE) counts of sniffing behavior in the pre-control (phase A) condition, experimental (phase B) condition, and post-control (second phase B) condition.



Figure 4 also shows a gradual reductions in sniffing behaviors in phase B. With regard to feeding behaviors, mean counts in phase B were significantly lower,  $F(2,7) = 23.97, p < 0.05$ , than in both the pre and post-baseline phase A conditions. (Figure 5).

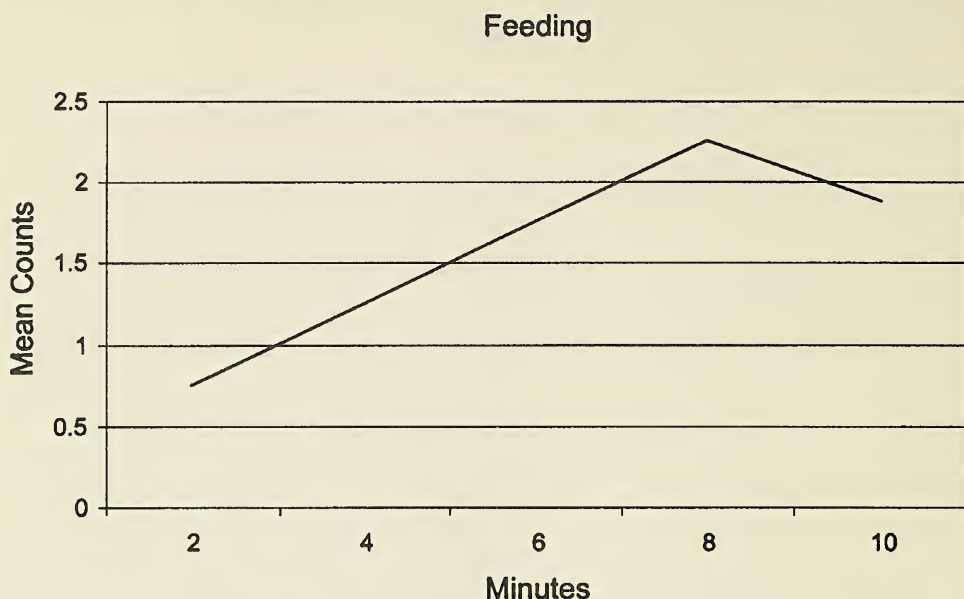


**Figure 4.** Mean counts of sniffing in the ball with food condition (experimental phase B), across 2 min. intervals.



**Figure 5.** Mean ( ± SE) counts of feeding behavior in the pre-control (phase A) condition, experimental (phase B) condition, and post-control (second phase B) condition.

Furthermore, Figure 6 shows a gradual increase in feeding behaviors in the latter half of the ball with food condition. Analysis of "other" behavior's showed no significant change as a result of the introduction of the Boomer Ball®,  $F(2,7) = 1.97$ ,  $p > 0.05$ .



**Figure 6.** Mean counts of feeding in the ball with food condition (experimental phase B), across 2 min. intervals.

### Discussion

Results confirm the hypothesis that the Boomer Ball® containing food would significantly alter the behavioral display of captive pygmy goats by increasing exploratory behaviors. The data clearly show that the ball with food decreased observed incidence of overt feeding behaviors, while increasing both locomotion and sniffing (exploratory behaviors). The increase in locomotion and sniffing provides evidence that the goats were actively exploring for their food, which supports Mellen et al. (1998) and Baer's (1998) initial findings. Therefore, the increases in these behaviors demonstrates that the goats were moving and sniffing in order to locate the alfalfa pellets that were scattered from the ball throughout the enclosure. This further confirms previous literature (Tudge, 1991; Shepherdson, et al., 1993), which states that many captive animals prefer to work for their food, possibly to give them a sense of control over their environment. Although the goats may prefer the taste of the alfalfa pellets over their normal daily food servings (alfalfa and grass hay), the results clearly indicate that the goats preferred earned food even though free food was available.

In addition, the results indicate that the Boomer Ball® caused a clear change in the activity level among pygmy goats. This finding is also congruent with initial findings (Baer, 1998), that novel objects introduced into enclosures increase animal activity levels. These increased activity levels, may in turn, provide the goats with many health benefits, some of which include healthier development and a greater chance for an early diagnosis of a disease and injury (Baer, 1998).

Although the Boomer Ball® with alfalfa pellets appears to be an efficient method for environment enrichment, a lack of sustained interest appeared problematic. Grandin (1988) stated that an effective toy used for environment enrichment must sustain long-term animal interest. Though the data shows a significant change in behavior during the 10 min. ball with food interval, these changed behaviors gradually decreased in the latter half of the condition. This may be due to many different factors, some of which appear more obvious than others. The most obvious explanation for the decrease interest in the Boomer Ball® is the depletion of food. That is, once the ball runs out of food, the goat's interest in the ball diminishes. The current study left all six holes in the ball exposed with



only two cups of alfalfa pellets per observation. Therefore future attempts for sustaining longer interest may include covering the majority of exposed holes with insert plugs, and adding more alfalfa pellets into the Boomer Ball®. Other studies using toys for enrichment in farm animals have shown that pigs lose interest in balls when they are soiled in excreta (Grandin, 1988). Therefore future experimenters may also choose to introduce the Boomer Ball® only intermittently and in limited episodes, such as immediately following the cleaning of animal enclosures. This would decrease the accumulation of waste material on the ball and prevent loss of interest.

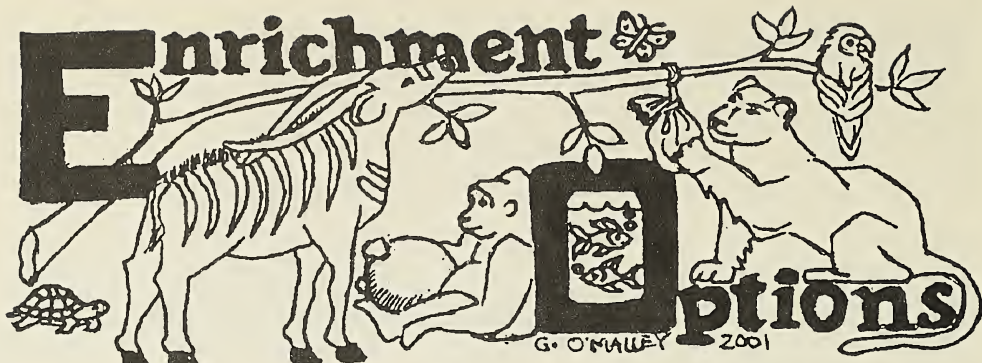
It has now become apparent how important an enriched environment is for captive animals that live in small enclosures. Simply employing low cost techniques, as demonstrated in the current study, can have many short, and long term advantages. The reduction of stereotypy and the increase in exploratory behaviors that novel objects provide may prevent long-term pernicious effects of captivity. Therefore, it is important for animal keepers and caregivers to provide an enriched environment to optimize animal well-being and health.

### Acknowledgements

The authors would like to thank Jonnene McFarland, Executive Director, and Marilyn McBirney, General Curator, of the Pueblo Zoo, for their helpful suggestions and cooperation in conduct of this research. Also, a special thanks to Aubrey Madrid for her help in the data analyses in the study. A preliminary report of these findings was presented at the annual meeting of the Colorado-Wyoming Academy of Science, Greeley, Colorado, April 2003. Request for reprints or questions concerning this article should be addressed to: Paul J. Kulkosky, Department of Psychology, Colorado State University-Pueblo, CO 81001-4901; e-mail: paul.kulkosky@colostate-pueblo.edu<

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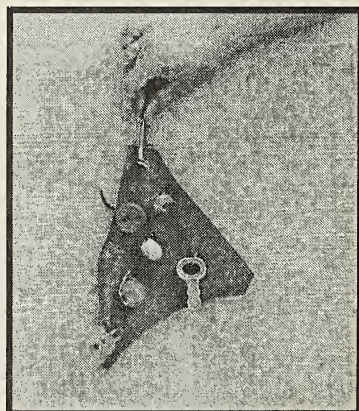
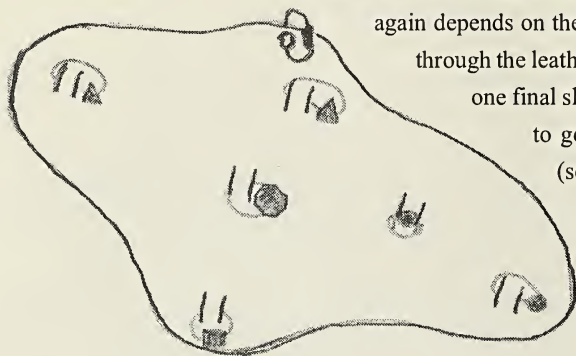
*EO Editors - Dawn Neptune, Utah's Hogle Zoo  
and Rachel Cantrell, Disney's Animal Kingdom*

## **Enrichment Ideas from the Frank Buck Zoo**

*submitted by Amy Davis, Keeper  
Frank Buck Zoo, Gainesville, TX*

**BEADED LEATHER CHUNKS** - In the never-ending progress of finding good parrot toys to keep those little beaks busy, we stumbled on a great idea - made possible by a creative volunteer. The only materials needed came from the local craft store for little money. First we used a chunk of leather about 5" x 8" (12.7cm x 20.3cm) [size may vary by bird], some leather thongs [leather shoe laces work well, too], and large plastic beads.

First make slits in the large chunk of leather about 1 1/2" (3.8cm) long in pairs [maybe 6-8 pairs of them]. Then string at least one bead on a piece of thong [the length again depends on the bird] about 6" (15.2cm) long and tie this through the leather adjoining the pair of slits. You will need one final slit near the outside and we use a "C" clamp to go through the hole for easy cage hanging (see drawing below).



Due to the ease with which a large parrot can break the thong, after doing so, the bird then has a "foot toy" to play with and manipulate in mouth and beak. Be sure to always use the large inch size beads to avoid any choking hazards. As our parrots here do not tend to chew apart the large chunk of leather or the beads, we are able to re-use these materials, only needing to replace thongs.



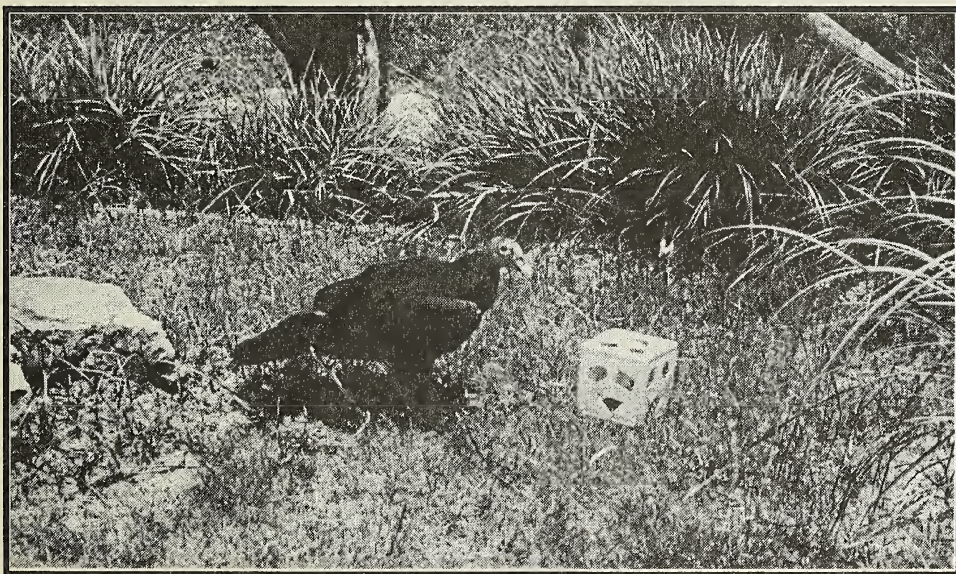
**SHOE ORGANIZERS AND “FORM FITTERS” - THE GREAT PUZZLERS** - Going to garage sales for enrichment items is a great way to save money on those daily things people have that they no longer want. For instance those shoe organizers made of cloth that hang on the door or the Playskool® “form fitters”.

With a dozen pockets for shoes and pre-made to hang with grommets, cloth shoe organizers are the ideal puzzle feeder. We have found animals such as raccoons, coatis, and kangaroos love the organizer with either treats or their diet put in the pockets. It should be a semi-dexterous and curious animal to make this idea a winner.

As far as the “form fitter” they can be used with or without the blocks that go inside. We no longer have the blocks for ours, so we do without--this makes the main objective just to get the food or treats out of the holes. However, if used with the blocks it would step up the level of difficulty and make the animal have to maneuver the blocks while trying to get the food out of the holes. We have successfully tried this with our vultures, tamarins, coati, and raccoons.



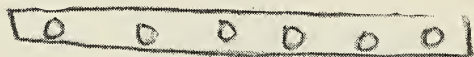
Again, these are two easy and cheap options to add to your enrichment collection to increase the forage time at or between feedings. Not only can these items be found at garage sales, but at the local Goodwill or on clearance at your local store. Always remember when introducing something new to an animal to be sure and watch their reaction and how they interact with it--safety first!





**PARROT O RINGS** - Buying bird toys from retail stores is expensive! But occasionally it is a good idea to visit them to gather ideas for toys you can make. That is where the next idea has come from.

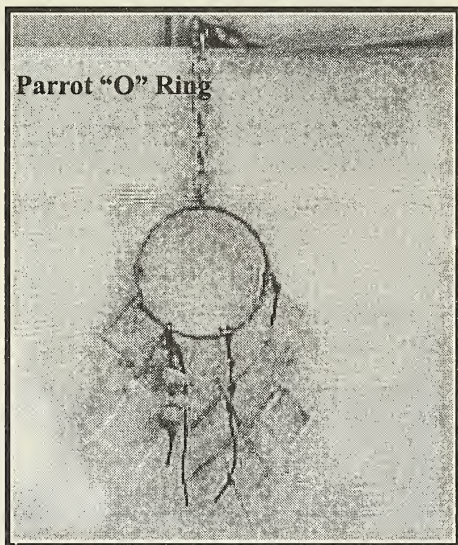
It is a "Parrot O Ring", simply put it is a 2' x 1 1/2" (.6m x 3.8cm) piece of steel flat strap welded into an O form with six holes either blown with a torch or pre-drilled, and a foot-



long piece of welded chain (see drawings at right and left).



After the bases of the toys were assembled, we painted them with a non-toxic children's paint. Next we used the holes to attach toy parts to. Toy parts can be a variety of things including: small wooden items, plastic beads, rawhide, popsicle sticks, etc...What we use here to attach them is either a natural rope like sisal or a medium gauge-wire--always careful not to make sharp ends or small loops in which toes can get caught.



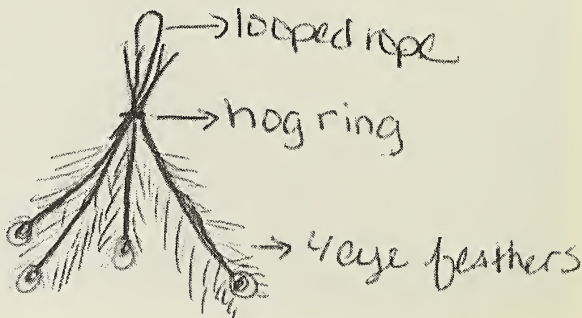
These welded pieces of flat strap work well because they are indestructible by the macaws and can be re-used when the toy parts are chewed up by adding fresh pieces.

**A USE FOR PEACOCK FEATHERS...** Looking in a popular bird catalog I saw peacock feather preening toys for almost \$10 each! At that moment I realized I had a seemingly never-ending supply of peacock feathers. I just needed to figure out how to do it...

I needed the feathers, some safe way to attach them, and something to hang my toy up with. I settled on

4 peacock feathers, 5 inches (12.7cm) of 1/2 inch diameter sisal rope [we stick with natural ropes such as sisal or twine for bird safety], a regular hog ring [1/2 inch rings used for attaching metal fencing found at the local ranching or home improvement store], and a "C" clamp to attach the sisal for easy installation.

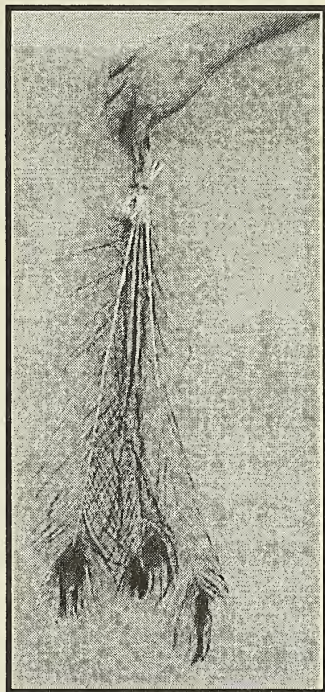
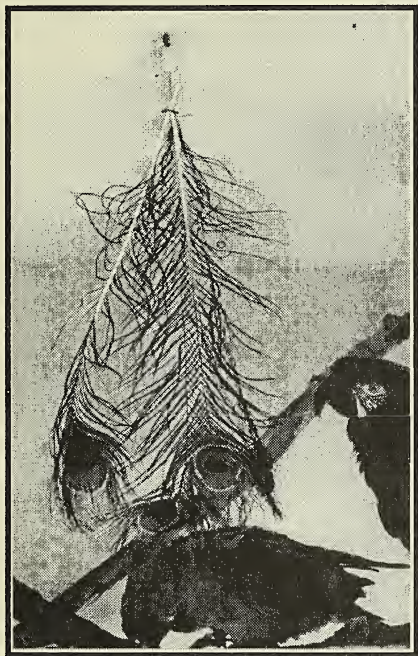
Steps to Assemble: 1) Arrange the feathers nicely, 2) Make a small loop with the rope and place at top of feathers, 3) Secure the hog ring around feather shafts and rope [rope should form a loop for "C" clamp]. Be sure





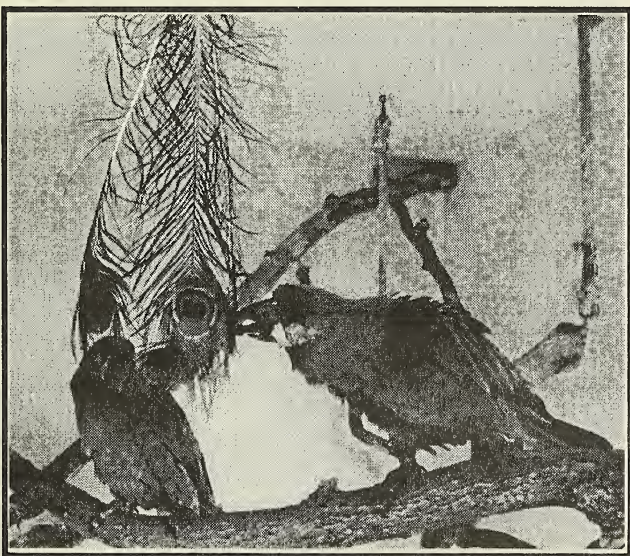
hog ring is closed fully - as not to make a pinch point or have any sharp edges, 4) Attach "C" clamp through loop to hang.

After putting it together, I gave one of our two military macaws to try out, as you can see from the photos below, it was a success. We had found a safe and cheap (less than \$1 each) alternative for a parrot-preening toy.



**Peacock Feather Bird Toys being used by a pair of military macaws**

*(Ideas appearing in this column have not necessarily been tested by the editors for safety considerations. Always think ahead and use good judgement when trying new ideas. You are invited to submit materials for the Enrichment Options Column. This might include recipes, toys, puzzle feeders, olfactory enrichment ideas, etc. Drawings and photos of enrichment are encouraged. Send to: AKF/Enrichment, 3601 S.W. 29th St., Suite 133, Topeka, KS 66614-2054. Eds.)*





# Legislative Update

Compiled by Georgann Johnston  
Legislative Advisor  
Sacramento, CA



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## 2,000 Baboon Noses Found in Airport Baggage

Customs officials in The Netherlands Schiphol Airport recently found an abandoned suitcase packed with over 2,000 smuggled baboon noses. The suitcase was thought to have come from Nigeria and was destined for the United States. The owner of the suitcase, who has yet to be identified, had apparently taken a flight from Nigeria to Amsterdam but abandoned the suitcase at the airport.

Dutch customs police turned the noses over to the Agriculture Ministry's Inspection Service, which reported that it had several leads that might help track down the perpetrators. The noses were probably meant to be eaten or used in traditional medicine by immigrants from Asian and African countries.

The noses have been destroyed according to Louis Steens, a spokesperson for the Inspection Service. "It's not unusual to find animal organs, such as eyes and brains, or plants in baggage from Asia and Africa - whose people use them as ingredients of their traditional medicines for healing purposes," said Steens. *Source: USA Today Newspaper 3 September 2003*

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## Proposal to Allow Importation of Icelandic Eider Down

The U.S. Fish and Wildlife Service (USFWS) has proposed a regulation to allow the importation into the United States of Icelandic eiderdown from wild nesting common eiders under limited and very specific conditions. "Icelanders have demonstrated that the sustainable harvest of eider down from wild common eider populations continues to boost their efforts to protect this migratory bird and its habitat," said Service Director Steve Williams. "The Service hopes that allowing the importation of eiderdown into the United States will further encourage private landowners in Iceland to conserve the common eider."

Icelanders have used eiderdown for more than 11 centuries and have exported it since the 14th century. From May to July, private landowners in Iceland collect down generally twice each season, taking great care to avoid disturbing brooding hens, replacing down removed from the nest with dry grass or hay. Recent studies conducted by the Icelandic Museum of Natural History show no evidence that down collection from wild populations has had any negative impact on the birds, including their ability to reproduce successfully.

Iceland has, since 1847, prohibited eider hunting. This ban, along with predator control and habitat management programs, has resulted in an increase of wild common eider populations. Populations of common eiders found elsewhere in the Northern Hemisphere appear to be declining. Of the three other Northern Hemisphere eider species, the status of the king eider is essentially unknown, while spectacled and Steller's eiders are both listed as threatened under the U.S. Endangered Species Act. All eider species are protected under the U.S. Migratory Bird Treaty Act.

The Circumpolar Eider Conservation Strategy and Action Plan adopted in 1997 by the member nations of the Arctic Council, an advisory group to which the United States belongs, advocates an international approach to manage all eiders in the Northern Hemisphere. The Plan also notes that the Icelandic population of common eiders has shown a long-term increase, and it endorses the development of down harvesting as a sustainable use of eiders.

"Our proposal to open the American marketplace to eiderdown is consistent with the recommendation of the Arctic Council," said Williams. "Icelanders would use some of the profits garnered from commercial trade with the United States, if allowed, to support their ongoing habitat conservation efforts for wild common eiders and other migratory birds."

True eiderdown from the common eider is a scarce luxury item, with annual worldwide production averaging less than three metric tons, at a total annual average price of less than \$2.2 million (U.S.). Iceland currently exports eiderdown primarily to Denmark, Germany, and Japan where it may be re-



exported elsewhere. Iceland must verify annually that they will not kill or injure MBTA-protected birds within and around the common eider breeding colonies in Iceland in order to remove other birds that may prey on or compete with the common eider. *Source: USFWS Press Release 5 September 2003*

### **Revisions for Endangered Species Conservation Agreements Proposed by USFWS**

The U.S. Fish and Wildlife Service has proposed two separate rules that would revise regulations governing conservation agreements for federally designated threatened and endangered species. "The Administration is continually looking for ways to make the Endangered Species Act work better. We believe these proposed changes will result in increased numbers of landowners working with us to develop Safe Harbor Agreements and Candidate Conservation Agreements with Assurances. Both of these programs provide immense conservation benefits while helping citizens coexist with imperiled species," said Service Director Steve Williams. Michael Bean of Environmental Defense, who has helped develop several safe harbor agreements, said that "these revisions should make it clearer and easier for landowners to participate in these novel conservation agreements."

Both Safe Harbor Agreements and Candidate Conservation Agreements with Assurances (CCAAs) are intended to remove potential disincentives for landowners to manage their property for the benefit of listed and candidate species. Some landowners have made it clear that they need a better understanding of the obligations and benefits provided by Safe Harbor Agreements and CCAAs before they will participate in agreements.

In other cases, property owners may be willing to actively help protect endangered or threatened species through Safe Harbor Agreements or CCAAs only if they can limit the area to be occupied by the species through intentional take, particularly when species expansion would interfere with activities outside of the area covered by the agreement. The proposed rules are intended to expand citizen conservation by addressing landowner concerns and more fully describe the range of activities that can be permitted in conjunction with a Safe Harbor Agreement or CCAA.

The first proposed rule will restate eligibility for Candidate Conservation Agreements with Assurances (CCAAs) and Safe Harbor Agreements. It will and provide definitions for conservation and mitigation consistent with related policies and the intent of the agreements. The proposal more explicitly provides landowners with greater certainty that such agreements will be altered only if continuing an authorized activity may jeopardize the existence of the protected species. Other options, such as the capture and relocation of the species, compensation for foregoing the activity, or purchase of the property or an easement would be given a priority when feasible, with permit revocation reserved as the option of last resort.

A second proposed rule would revise the permit associated with Safe Harbor Agreements and CCAAs to more clearly state the Service's ability to authorize "take" (capturing, killing or otherwise disturbing or harming a species or its habitat) in conjunction with activities such as reintroduction and habitat restoration when the benefits of habitat protection or restoration provided by the associated agreements outweigh any impacts caused by anticipated take of protected species. By ensuring that traditional agricultural uses can continue alongside habitat improvements, this provision can make it easier for landowners to enter into SHAs and CCAAs that will provide overall benefits to the species.

"Both proposed rules will create a cooperative context that encourages landowners to participate as citizen stewards in protecting endangered, threatened, and other species," Williams said.

The Service encourages the public to send comments on both proposed rules to Division of Endangered Species, U.S. Fish and Wildlife Service, Room 420, Arlington Square Building, 4401 North Fairfax Drive, Arlington, VA 22203. The text of the proposed rules can be found in the September 10, 2003 *Federal Register*. *Source USFWS Press Release 12 September 2003*

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### **USFWS Withdraws Permits for Killing Mute Swans**

The USFWS agreed to withdraw all permits for state and federal officials to kill mute swans said to pose an environmental threat in 17 Eastern states. The offer needs final approval from a federal judge, who granted an injunction in August 2003 prohibiting the killings until he ruled in a lawsuit brought by the Fund for Animals, a New York-based advocacy group. The lawsuit challenged a permit issued to Maryland to kill the birds. Swans are protected by the federal Migratory Bird Treaty Act.

Maryland officials said mute swans are destroying Chesapeake Bay habitat by eating underwater grasses and crowding out native birds, while the Fund for Animals said the birds are scapegoats for the bay's environmental problems. The Atlantic Flyway Council, composed of state wildlife departments, has recommended the 2002 population of 14,000 mute swans be reduced to 3,000 by 2013.

Nicholas Throckmorton, spokesman for Fish and Wildlife, said it decided to withdraw the permits because federal judge Emmett Sullivan "discouraged us from pushing this further." He continued, "The judge suggested if we, the service, tried to push this forward legally, we would not win." Sullivan was scheduled a hearing on the lawsuit Oct. 6.

Asked if Fish and Wildlife would try again to issue permits to kill swans, Throckmorton said he wasn't sure. He said the agency would review the environmental assessment it made to justify the need to kill some of the swans, which are nonnative birds that first entered the United States from Europe two centuries ago.

Michael Markarian, President of the Fund for Animals, said the decision to withdraw permits "is a colossal step for thousands of graceful and majestic mute swans." He said swans have been unfairly blamed for environmental damage that is primarily caused by factory farms and inefficient sewage treatment plants.

Jonathan McKnight, Associate Wildlife Director for the Maryland Department of Natural Resources, said the state remains determined to do something to control the mute swan population, which he estimates is about 3,600 in the Maryland portion of the Chesapeake Bay. But he said he doesn't know what steps the state could take. "We are certainly shut down for the rest of this year," he said. *Source: Environmental News Network 19 September 2003*

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### **Harvesting Endangered Species Next--Bush Proposal Draws Flack**

The Bush regime has proposed "far-reaching changes to conservation policies that would allow hunters, circuses and the pet industry to kill capture and import animals on the brink of extinction in other countries" reports the *Washington Post*. Administration officials claim that changing the long-standing ESA policy banning trade in endangered species would "feed the gigantic U.S. demand for live animals, skins, part and trophies and generate profits that would allow poor nations to pay for conservation of the remaining animals and habitat." But many conservationists "charge that the policies cater to individuals and businesses that profit from animal exploitation" and that "opening the door to legal trade will allow poaching to flourish."

This latest Bush administration proposal to harvest endangered species for profit has provoked one of the world's most renowned conservationists, Jane Goodall, to charge "the White House with leading an onslaught, against the ESA that could lead to more African animals being killed or captured for profit" reports *SFGate.com/AP*. Goodall called efforts over the last three years to roll back environmental laws "terrifying" and warned "her beloved apes and other species face a threat from the Bush administration that could undo decades of conservation efforts. *Source: GREENlines Issue 1970 10-15-03*

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### **Madagascar Triples Protection**

"Home to some 10,000 endemic plant species, 316 endemic reptile species and 109 species of birds found nowhere else in the world," Madagascar announced that it intends to more than triple the size of its nature reserves reports *Planet Ark/Reuters*. Although humans have inhabited the island for only 2,000 years, only nine million out of an original 50 million acres of forest remains, resulting in the near extinction of many lemur species. Most of the current nature reserves are too small, poorly protected or suffer from human encroachment. *Source: GREENlines Issue#1954 9-22-03*

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### **Ferret Count Strong**

August surveys in Wyoming's Shirley Basin have "found more than 50 of the endangered ferrets in the area where they first reintroduced to the wild" reports the *Ravalli Republic/AP*. Biologists are "overjoyed at the tally," which is up from 5 in 1997, 15 in August 2000, and 19 in 2001. Between 1991 and 1994, 228 captive-born black-footed ferrets were released and biologists says "When you look at the bottlenecks of disease, drought and flash floods this population has endured and overcome, this year's discovery helps confirm that the Shirley Basin is very suitable habitat." *Source: GREENlines Issue #1964 10-06-03*



*Institutions wishing to advertise employment opportunities are asked to send pertinent data by the 10th of each month to: Opportunity Knocks/AKF, 3601 SW 29th St., Suite 133, Topeka, KS 66614-2054. Please include closing date for positions available, and when setting these dates keep in mind that because of bulk-mail, most readers do not receive their AKF until the middle of the month or later. There is no charge for this service and fax or e-mail listings of positions which become available close to deadline are accepted. Our Fax is (785) 273-1980; e-mail: [akfeditor@zk.kscoxmail.com](mailto:akfeditor@zk.kscoxmail.com)< Listing may be sent as MS Word attachment. We are no longer located at the Topeka Zoo, so please note new address to avoid delays in processing.*

**Mammal/Bird Keeper - Cougar Mountain Zoo, Issaquah, WA**

Please send a cover letter and resumé to: Cougar Mountain Zoo, 19525 SE 54th, Issaquah, WA 98027; or Fax to (425) 392-1076; or E-mail to [CougarMZoo@aol.com](mailto:CougarMZoo@aol.com)< This is a Full Time permanent position, benefits included. Salary depends on experience. **Responsibilities:** animal keeping involving some of the following species: cougars, lemurs, hoofstock (reindeer/antelope/deer), macaws, parrots, cranes and others. Daily routine husbandry, maintenance of exhibits, record keeping, assist in veterinary practices, behavior enrichment, etc. Involvement in Education such as tour guide, mini lecture speaker, animal demos and walks, outreach presentations, etc. **Requirements:** Ability to work in a harmonious manner with staff, volunteers and supervisors and work any of the seven days of the week. Prefer AS/BS degree in biology/zoology-related field and minimum of two (2) years full-time paid experience in zoological institution.

**Zookeeper/Asian Domain - Audubon Zoo, New Orleans, LA**

Send resumé to Director of Human Resources, Mike Burnett, 6500 Magazine St., New Orleans, Louisiana 70118 or e-mail: [mburnett@auduboninstitute.org](mailto:mburnett@auduboninstitute.org). **Responsibilities:** primary responsibilities will include daily care and management of 0.2 Asian elephants in a free-contact program. The candidate will assist in the development of the program and future planning of a new elephant exhibit under the direction of the Assistant Curator. Other responsibilities will include assisting in carnivore/ungulate routines. Duties will include behavioral observations, record keeping, assisting in veterinary procedures, capture and restraint, exhibit maintenance and interacting with the public. **Requirements:** good written/oral communication skills and the ability to work effectively in a team-oriented environment. Associate's degree in biology or related field and three years' zoo experience preferred in the care of mammals, preferably carnivores and ungulates. A minimum of three (3) years experience working elephants in free contact preferred. All candidates must have the ability to lift up to 80 lbs. and a willingness to work outdoors. A willingness to work weekends, holidays, and/or overtime is required.

**Zookeeper - Zoo Nebraska, Royal, NE**

Send cover letter and resumé to: Dale Bakken, Director, Zoo Nebraska, P.O. Box 26, Royal, NE 68773. **Requirements:** Must be self-motivated, able to lift 60 pounds, work weekends and in all weather conditions. Experience with carnivores and/or chimpanzees would be an asset.

**Primate Keeper - Pok Pok and Pant Hoots, Wauchula, FL**

Position for Great Ape Caregiver at Non-Profit Sanctuary. If interested contact Ray, [pantrog@strato.net](mailto:pantrog@strato.net) or send resumé to: P.O. Box 488, Wauchula, Florida 33873. **Responsibilities:** Primary duties include cage cleaning with heaving lifting. Must be physically fit. Animal experience helpful. Drug Free Workplace and Smoke Free Environment.

**Big Cat Internships - Tiger Creek Wildlife Refuge (TCWR), Tyler, TX**

As seen on Animal Planet in "Growing Up Tiger", TCWR is a division of Tiger Missing Link Foundation. Commencement date: On-going duration: three (3) months on a month-by-month basis. For additional information to see what past interns have to say about Tiger Creek, visit [www.tigercreek.org](http://www.tigercreek.org)< Are you interested in learning more about big cats or establishing a career path working in conservation as a zookeeper, a wildlife manager or a veterinarian? You can Earn Your STRIPES at Tiger Creek and obtain college credit through your college or university at the same time, there are up to four (4) positions available. At Tiger Creek you are more than a worker, you are considered a friend and we strive to build long-term working relations as we know you are the future animal caretakers! Interns are utilized for permanent animal care positions through a qualification system with opportunity for full-time paid animal keeper positions available based upon performance after training. **Requirements:** You provide a six (6)-day work week with a strong commitment for three (3) months, be capable of paying attention to details and follow safety rules, you must have your own transportation to and from the refuge and provide your own food while here. We provide room & board, uniforms, materials and curriculum, indoctrination and safety training. We even throw in use of the "tiger truck" for errands and entertainment adventures that you seek out. Within the new Intern House there is central heat and air, all furnished, a full kitchen, with two full bathrooms, two rooms shared by two students, a shared telephone line for incoming calls, internet access for email and surfing, a VCR, TV and even Satellite so that you and the other interns can enjoy Animal Planet during your off hours! All of this

and a few rescued dogs or puppies in the backyard...because we want your stay to be as comfortable as possible while here at Tiger Creek. The Tyler-East Texas area has a lot to offer, there is horse back riding available at no cost to our interns, lakes within beautiful parks, movie theaters, numerous local night clubs and plenty of restaurants and much more.

**The following three (3) internship opportunities are available at the New Jersey State Aquarium -** The New Jersey State Aquarium husbandry department is currently holding open enrollment on all our internships.

#### **Avian Internship**

Interested candidates should submit a cover letter and resumé, transcripts, three (3) letters of recommendation, and an application from our website at [www.njaquarium.org](http://www.njaquarium.org). Please submit materials to: New Jersey State Aquarium, c/o Kyla Fox, One Riverside Drive, Camden, NJ 08103. Become familiar with daily activities involving our colony of African penguins, exotic birds, and reptile collection. **Responsibilities:** Duties include food preparation, exhibit maintenance, and creation of enrichment devices. **Requirements:** Candidates should be comfortable with public speaking and have course work in biology/psychology. Must be able to work outdoors and lift 50 pounds. Interns are required to complete a minimum of 120 hours and must be registered for college credits in either a two or four-year school. Internships may be completed during spring, summer, or fall sessions. All intern positions are on a volunteer basis and are unpaid.

#### **Marine Mammal Internship**

Interested candidates should submit a cover letter and resumé, transcripts, three (3) letters of recommendation, and an application from our website at [www.njaquarium.org](http://www.njaquarium.org). Please submit materials to New Jersey State Aquarium, c/o Collette Caprio, One Riverside Drive, Camden, NJ 08103. Learn daily activities involving animal care and training with our Seal Team. **Responsibilities:** Duties include food preparation, exhibit cleaning, creating enrichment devices and observing training. **Requirements:** Candidates should be comfortable with public speaking, have course work in biology/psychology, prior animal experience, be able to work outdoors, and lift 50lbs. Interns are required to complete a minimum of 120 hours and must be registered for college credits in either a two or four-year school. Internships may be completed during spring, summer, or fall sessions. All intern positions are on a volunteer basis and are unpaid.

#### **Fish and Invertebrate Internship**

Interested candidates should submit a cover letter and resumé, transcripts, three (3) letters of recommendation, and an application from our website at [www.njaquarium.org](http://www.njaquarium.org). Please submit materials to New Jersey State Aquarium, c/o Nicole Grandinetti, One Riverside Drive, Camden, NJ 08103. The Fish and Invertebrate department offers internships each semester to qualifying candidates. **Responsibilities:** The interns main responsibilities will be assisting the biologists with their daily duties including exhibit and holding tank maintenance, food preparation, feeding, filter maintenance, and learning all aspects on maintaining saltwater exhibits. **Requirements:** Interns must complete 120 hours within the semester working two eight-hour days. The typical hours for the day are from 7:30am to 4:30pm. Interns are also required to be registered for credits through a two or four-year institution. All Interns work under a volunteer basis and are unpaid.

#### **Big Cat Internship – Wildlife on Easy Street, Tampa, FL**

For more information contact Scott Lope at 813-323-5991 or email at [catfoto1@aol.com](mailto:catfoto1@aol.com)

Two (2) positions available for six-month internship at TAOS accredited non-profit big cat sanctuary. [www.wildlifeoneasystreet.com](http://www.wildlifeoneasystreet.com) < **Responsibilities** (include but are not limited to): daily husbandry, exhibit cleaning, diet preparation, feeding, operant conditioning and behavioral enrichment for the following species: lions, tigers, leopards, cougars, lynxes, servals, caracals, bobcats, lemurs and other exotic animals. We provide invaluable hands-on experience, on-site housing and utilities, safety training and educational materials. Advanced training and long-term employment opportunities exist for the right candidates. **Requirements:** applicants must be willing to work six days a week, some holidays and follow strict safety guidelines. Hard work ethic and love of animals more important than degree.

#### **Internships - The Florida Aquarium, Tampa, FL**

Internships are available in Animal Health, Animal Programs and Husbandry departments. Internships available year-round for varying lengths of time and can be tailored to the individual student's needs. Internships are unpaid but provide valuable hands-on experience. Interested persons should send resumé to: Human Resources, 701 Channelside Dr., Tampa, FL 33602. For more information visit our website at [www.flaquarium.org](http://www.flaquarium.org) < **Responsibilities:** food preparation, feeding, cleaning enclosures, assist with medical procedures, animal observations, daily record keeping, enrichment activities, assist with training sessions and shows.



### **Aviculture Interns - Keauhou Bird Conservation Center, Hawaii and Maui**

For more information on internships at **KBCC**, please send a resumé, cover letter, and the names and contacts of three (3) references to: Tracey Goltz P.O. Box 39 Volcano, HI 96785 or fax: 808-985-7034. **OR**, for more information on internships at **MBCC**, please send this information to: Mary Schwartz 2375 Olinda Road Makawao, HI 96768 or fax: 808-572-3574. For the Hawaii Endangered Bird Conservation Program at the Keauhou Bird Conservation Center (KBCC) on the Big Island of Hawaii and the Maui Bird Conservation Center (MBCC) on the island of Maui. **Responsibilities:** Daily tasks include husbandry duties such as: diet preparation, aviary and facility maintenance, behavioral observations of breeding birds, grounds keeping, predator control. **Requirements:** Applicant must be able to live with several roommates in a remote area and should show enthusiasm for work with captive endangered Hawaiian birds. Applicant must have a valid driver's license and health insurance. Internships last for a 3-6 month period. Interns receive \$20/day stipend plus housing. **Please, no phone calls or emails.**

### **Internship Opportunities - National Aquarium in Baltimore**

To apply for any of the following internship positions go online at [www.aqua.org/education/internships](http://www.aqua.org/education/internships) to obtain an application form. A complete application includes contact information, answers to brief statements listed, and a copy of college transcript. Complete applications should be sent to: National Aquarium at Baltimore-Internships, Pier 3/501 East Pratt St., Baltimore, MD 21202.

Application Deadline: ongoing - 1 November 2003 for January and Spring terms of 2004; 1 April 2004 for Summer and Fall 2004 terms; All interns must complete a minimum of 120 hours of work within the selected term. Interns must receive college credit for their internship. Internships are unpaid. For further information contact the National Aquarium in Baltimore's Internship coordinator at [intern@aqua.org](mailto:intern@aqua.org) or call (410) 576-3888.

#### **Aquarist Intern**

**Responsibilities:** The selected candidate will assist the Aquarium aquarist staff with daily care of the Aquarium's invertebrates and fish. Assist with tank maintenance and cleaning; Prepare daily diets and perform daily feedings; Assist in the maintenance of back-up areas; Conduct precise record keeping; Perform special projects to be determined by the aquarist staff. **Requirements:** College juniors or seniors enrolled in an accredited college, pursuing a degree in Biology, Ecology, Environmental Science, or a related field. Must be able to lift 50 lbs, climb up a 6' ladder, and be able to squeeze across a 15' long x 12" wide platform.

#### **Aviculture Intern**

**Responsibilities:** The selected candidate will assist the Aquarium aviculture staff with daily husbandry activities in the South American Rainforest exhibit. Assist with and perform diet preparation and distribution; Conduct animal observations; Assist in the cleaning of holding areas, kitchen, and food prep areas; Provide enrichment to the aviculture collection; Perform special projects as determined by the aviculture staff. **Requirements:** Interest in working with birds. Enrolled in an accredited college, pursuing a degree in Biology, Zoology, Animal Behavior, Ecology, Environmental Science, or a related field.

#### **Herpetology Intern**

**Responsibilities:** Tend the "Hidden Life" exhibits (large wall terrariums where small, neotropical lizards, frogs, snakes and invertebrates are on public display); Mist and clean the off-exhibit colony of small arboreal lizards; Mist, clean and otherwise help tend the large, off-exhibit collection of neotropical frogs; Prepare diets for and feed the on and off-exhibit iguanas and tortoises; Tend the locust (live food) colony, orb-weaving spiders and colonies of non-venomous exotic arthropods (wood and hissing roaches, millipedes and walking sticks); Assist in the maintenance of the live food cultures (fruit flies, springtails, crickets, rats, mice); Conduct and record animal observations; Perform special projects as determined by the herpetology staff. **Requirements:** Must be enrolled in an accredited college, pursuing a degree in Biology, Zoology, Animal Behavior, Ecology, Environmental Science or a related field. Must be comfortable working with frogs, lizards, rodents and terrestrial arthropods.

#### **Horticulture**

**Responsibilities:** The selected candidate will assist the Aquarium horticulture staff with daily activities. Assist with care of plants in the Rain Forest exhibits; Conduct plant maintenance, fertilization, propagation, and transplantation; Assist in display development; Perform special projects as determined by the horticulture staff. **Requirements:** Must be enrolled in an accredited college, pursuing a degree in Biology, Ecology, Environmental Science, or a related field.

#### **Marine Animal Rescue Program (MARP) Intern**

**Responsibilities:** The selected candidate will aid in all aspects of marine animals rescue program (MARP) operations, which involves the rescue, rehabilitation, and release of stranded marine mammals and sea turtles and implementing outreach efforts of the Aquarium's Ocean Health Initiative. The selected candidate is also responsible for technical and clerical assistance for the Conservation Department staff as necessary.

**Duties include:** Animal Care – participating in rescue and release trips, daily feeding, medical treatments, facility maintenance including cleaning and water changes, behavioral observations, and record keeping; Outreach – learning to interpret the MARP artifacts and conservation messages and participation in seasonal outreach and public education programs at the Aquarium and off site; Other duties as assigned – field work, etc. **Requirements:** Must be college junior or senior majoring in environmental science or related field with course work in biology and ecology. Summer and January terms require 40 hours per week of work for 4 weeks. Spring and fall terms require 8 hours per day, one day per week of work.

#### Marine Mammal Trainer Intern

**Responsibilities:** The selected candidate is responsible for providing support to the marine mammal training staff. This internship's primary purpose is to teach the intern training theory. **There is limited hands-on animal contact during the internship.** **Duties will include:** Prepares daily animal diets and dispenses vitamins as instructed; Responsible for the cleanliness and safety of all animal back-up areas; Assists in training, husbandry, and medical sessions; Participates in pre-show and pre-session preparations; Periodically participates in sessions involving swimming during enrichment and play sessions – no animals involved; Other duties as assigned. **Requirements:** Must be college junior or senior majoring in life science or related field. Must have a basic understanding of marine mammal natural history. Must have good swimming skills. Must work well as a team member. Summer and January terms require 40 hours per week of work for 4 weeks. Spring and fall terms require 8 hours per day, one day per week of work.

#### Water Quality Lab Intern

**Responsibilities:** The selected candidate will assist in the water quality testing of all fish and mammal systems throughout the aquarium. Duties include testing water for salinity, pH, ammonia, nitrite, alkalinity, and copper according to lab procedures, and recoding neat, accurate data. The selected candidate will work closely with the Lab Technicians and the Animal Husbandry staff. **Requirements:** Must be college junior or senior with general biology and chemistry work. Strong math skills and computer proficiency preferred. Must be available to work mornings.

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#### Zoo Employees and Wild Animal Liability, cont'd from pg. 451

focuses on the phrase “in the possession or control of a local agency,” one would tend to conclude the exact opposite of what the court held, namely that Pittsburgh *could* be sued. The dolphin was, after all, specifically and entirely in their control.

Since *Sakach v. City of Pittsburgh* was decided on sovereign immunity grounds, the question was not raised whether Sakach could alternatively have been denied recovery on a theory of assumption of risk, as was the holding in *Bormann*, the Milwaukee deer case. Is a zoo volunteer in a similar position to a zookeeper; has she no grounds for legal relief if she is injured by an animal because she is presumed to know the potential hazard she faces? It would be preferable for zoos to take every step to make volunteer experience so safe that courts need not address this question.

#### Conclusion

From a judicial standpoint, the cases examined here were examined under a variety of legal concepts: strict liability, negligence, assumption of risk, master-servant law, and sovereign immunity. To a zoo employee, these words and phrases are of less concern than the reality of the injuries inflicted by the animals as described in the cases. Reading the facts of the litigation considered in this article should remind zookeepers and other zoo workers that a great duty of care goes into the maintenance of potentially dangerous animals. Safety is paramount, and avoidance of animal related injuries must be a goal shared by all.

#### Appendix

Listed below are the legal citations for the cases mentioned in this article, in the order that discussion occurred:

Jackson v. Baker, 24 App. D.C. 100 (1904).  
Bormann v. City of Milwaukee, 67 N.W. 924 (Wis. 1896).  
Oklahoma City v. Hudson, 405 P.2d 178 (Okla. 1965).  
Normand v. City of New Orleans, 363 S. 2d 1220 (La. 4<sup>th</sup> Cir. 1978).  
City of Mangum v. Brownlee, 75 P.2d 174 (Okla. 1938).  
Sakach v. City of Pittsburgh, 687 A.2d 34 (Pa. Cmwlth. 1996).

#### References

Bannor, B. 2003. Captive animal liability: 19<sup>th</sup> century foundations and 20<sup>th</sup> century modifications. *Zoo Biology*, in press.  
Gifis, S. H. 1996. Law dictionary, 4<sup>th</sup> ed. New York: Barron's Educational Services, Inc. 561 p.  
Keeton, W.P., ed. 1984. Prosser and Keeton on the law of torts, 5<sup>th</sup> ed. St. Paul, MN: West Publishing. 1286 p.  
Schama, S. 1995. Landscape and memory. New York: Vintage Books. 563 p.



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# ANIMAL KEEPERS' FORUM



The Journal of the American  
Association of Zoo Keepers, Inc.

**DECEMBER 2003**



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### **AAZK PUBLICATIONS - CONTINUING DATA COLLECTION**

Biological Information (formerly Biological Values), 4th Edition - Jan Reed-Smith, Columbus Zoo

AAZK Enrichment Notebook 3rd Edition - Lee Houts, Folsom City Zoo



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## About the Cover.....

This month's cover features Tufani, the first African elephant (*Loxodonta africana*) to be born at Disney's Animal Kingdom, Orlando, FL. It was drawn by Jeff Wells, an Animal Keeper in the Ituri Forest. Tufani means "storm" in Swahili, an East African dialect. He was given his name due to being born during a thunderstorm at 10:05 p.m. on Thursday, 22 May 2003. He was conceived via artificial insemination. His mother, Moyo, is a 21-year-old cow and Tufani is her first calf. He was born after a gestation period of 636 days and weighed 296 lbs. at birth. DAK's African elephant collection currently consists of 3.7 adults and, now, of course, one male calf. Tufani's birth is very significant in that African elephants are difficult to breed in captivity. His birth marks only the seventh successful such birth in North America during the past 20 years. Since the park's opening five years ago, Disney's Animal Kingdom has not only fostered a breeding program with African elephants, but has also carried out valuable research including research on elephant vocalizations. At times the elephants are fitted with specialized radio collars so that their low frequency vocalizations, called rumbles, can be recorded. Once recorded, the vocalizations known as infra-sounds are matched with the elephants' behavior, which are also recorded and tracked. The scientists at DAK have been successful in "cracking the codes" of some of these low frequency vocalizations. In the wild, it is believed that African elephants can communicate over long distances by using these low frequency rumbles. It is possible that they receive some of these "messages" sent by their fellow elephants through the thick pads on the bottom of their feet. Thanks, Jeff!

*Animal Keepers' Forum* publishes original papers and news items of interest to the animal keeping profession. Non-members are welcome to submit articles for consideration. Articles should be typed or hand-printed and double-spaced. Authors are encouraged to submit their manuscripts on a disk as well as in hard copy form. Manuscripts submitted either on disk or electronically as attachments to an email should be submitted in Microsoft WORD. All illustrations, graphs, charts and tables should be clearly marked, in final form and should fit in a page size **no greater than 5.5" x 8.5"** (14cm x 22cm). Literature used should be cited in the text (Brown, 1986) and alphabetically in the final bibliography. Avoid footnotes. Include scientific name (as per ISIS) the first time an animal name is used. Thereafter use common name. Use metric system for weights and measurements (standard equivalents may be noted in parenthesis). Use the continental dating system (day-month-year). Times should be listed as per the 24-hour clock (0800, 1630 hrs. etc.). Glossy black and white or color prints (minimum size 3" x 5" [8cm x 14cm] ) are accepted. Clearly marked captions should accompany photos. Please list photo credit on back of photo. Photographs may be submitted electronically as either JPEG or TIFF file attachments.

Articles sent to *Animal Keepers' Forum* will be reviewed by the editorial staff for publication. Articles of a research or technical nature will be submitted to one or more of the zoo professionals who serve as referees for *AKF*. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Lengthy articles may be separated into monthly installments at the discretion of the editor. The editor reserves the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed, appropriately-sized envelope. Telephone, fax or email contributions of late-breaking news or last-minute insertions are accepted as space allows. Phone 1-800-242-4519 (US); 1-800-468-1966 (Canada); FAX (785) 273-1980; email is [akfeditor@zk.kscoxmail.com](mailto:akfeditor@zk.kscoxmail.com)

**Deadline for each regular issue is the 10th of the preceding month.**

**Dedicated issues may have separate deadline dates and will be noted by the editor.**

Articles printed do not necessarily reflect the opinions of the *AKF* staff or the American Association of Zoo Keepers, Inc. Publication does not indicate endorsement by the Association.

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E-Mail Addresses: You may reach Barbara Manspeaker at AAZK Administrative Offices at: [aazkoffice@zk.kscoxmail.com](mailto:aazkoffice@zk.kscoxmail.com)< You may reach Susan Chan and *Animal Keepers' Forum* at: [akfeditor@zk.kscoxmail.com](mailto:akfeditor@zk.kscoxmail.com)<

**AAZK Website Address: [www.aazk.org](http://www.aazk.org)**

**BFR Website: <http://bfr.aazk.org>**



# *Scoops & Scuttlebutt*



## **Chapters Reminded About Recharter Packets**

All Chapter officers are reminded that annual Recharter Packets are mailed in January and must be returned to AAZK Administrative Offices **by 1 March 2004** to avoid paying the \$100 late fee. If you have questions about filling out your forms, contact Barbara Manspeaker at 1-800-242-4519 (US) or 1-800-468-1966 (Canada). You can also reach Barbara via email at [aazkoffice@zk.kscoxmail.com](mailto:aazkoffice@zk.kscoxmail.com). Make certain when you return your packets that you have completed all required information and have included a check for your recharter fee. Make a copy for your Chapter's records. Return of these forms is part of the Association's obligation to the Internal Revenue Service under our 501 (c)(3) nonprofit tax-exempt status. Failure to have forms returned by all of AAZK's chartered Chapters puts that tax-exempt status in jeopardy, so your full cooperation is greatly appreciated.

## **Recent Donations Helps Adopt-A-School Program**

AAZK, Inc. and the Lewa Wildlife Conservancy wish to thank Linda Brown, a Docent at the Louisville Zoo, for her donation of \$100.00 to help fund the Lebarua School Lunch Program. Thanks also go out to the Virginia Chapter of AAZK for their generous donation of \$250.00 to this project. The cost to feed one child for a term is \$5.20 and the current Lebarua School population can be fed for an entire term for \$1,175.00, so Linda's and the Virginia Chapter's donations will certainly go a long way towards helping reach that goal. If you would like to know more about this program, see the October 2003 issue of *AKF*, pages 408-409.

## **AAZK Announces Availability of Granting Programs**

The American Association of Zoo Keepers announces the availability of two granting opportunities:

*The Conservation, Preservation and Restoration (CPR) Grant* – This \$1,000.00 grant is designed to encourage and support efforts in conservation conducted by keepers and aquarists in zoological parks and aquariums around the world. Members of AAZK, Inc. in good standing are eligible to apply and receive this grant. The member **MUST** have an active role in the conservation effort submitted for consideration. The division of this grant between two projects is at the discretion of the CPR committee. Funds are made available only after a progress report and receipts have been submitted.

*The Zoo Keeper Grants in Research* – Two \$1,000.00 grants are funded annually to encourage and support noninvasive research conducted by keepers in zoo and aquarium settings. The principal investigator **MUST** be a full-time keeper and a member of AAZK, Inc. in good standing.

Deadline for application submission for either grant option is 01 June 2004. Successful grant recipients will be announced at the AAZK National Conference in Fall 2004. The grant cycle runs from 01 January 2005 to 31 December 2005. For further information or an application see the AAZK Website at [www.aazk.org](http://www.aazk.org), or contact Jan Reed-Smith, AAZK Grants Committees' Chair, [jrsotter@iserv.net](mailto:jrsotter@iserv.net), 616-693-2680, Fax: 616-374-3263. Please specify which grant program you are interested in.

## **Bat TAG Announces Small Grants Program**

The AZA Bat TAG would like to announce a small grants program. Grants are available to zoo and aquarium staff who are engaged in scientific efforts related to bat management, conservation

education, *in situ* biological conservation, veterinary helath, nutrition, zoological research and reproduction, especially projects involving threatened and endangered species. The application deadline is **1 January 2004**, with awards of up to \$500 being announced in February 2004. Program application and guidelines are available from Steven M. Wing, AZA Bat TG Co-chair, Riverbanks Zoo, P.O. Box 1060, Columbia, SC 29202-1060 or at [swing@riverbanks.org](mailto:swing@riverbanks.org)<

### **SOS Rhino Seeks Volunteers**

SOS RHINO is looking for volunteers interested in helping in their efforts to save the Sumatran rhinoceros. Their Borneo Team is studying the demographics of the remaining animals in Tabin Wildlife Reserve to determine when patrol units, habitat protection, or translocation may play a role in the rhinos' survival. Check out their website at: <http://sosrhino.org/programs/volunteer.php>< for details of this volunteer program.

### **Dallas Chapter to Continue Chapter Challenge "Tradition"**

The Dallas Chapter of AAZK, hosts of your 2004 National Conference "*Pursuing Your Wild Passions*" announces the continuation of what we hope will become a new AAZK Conference tradition. In the spirit of support generated by the Cleveland Challenge, we are issuing the **Chapter Challenge 2004**.



**What is it?** In order to keep delegates' cost to a minimum, while ensuring the best possible conference, we are encouraging Chapters to donate. If your Chapter contributes \$250.00 or more, they will be entered into a drawing. The winning AAZK Chapter will receive one full registration and one double occupancy room for five nights at the Adam's Mark Hotel (Sept 26-30, 2004). Letters detailing all the information will be sent to all AAZK Chapters in January. Start planning now to met the challenge!!!

### **Cleveland AAZK Chapter Offers Another Challenge**

So you thought the "Cleveland Challenge" was over? Think again. We're back. We know... you can't get rid of us. We just enjoyed planning the 2003 AAZK Conference so much that we thought we would continue you on with the next phase. We have decided to institute the "Cleveland Challenge-Round 2."

Since the "Cleveland Challenge" encouraged so many of you to donate to our conference, we want to now encourage you to donate to AAZK, Inc. So here's the rules: for any Chapter donating to AAZK, Inc. we will **match your donation** dollar for dollar up to \$5000 from now until **1 April, 2004**. AAZK, Inc. needs all of our support, and this way your dollars will be worth double. So when you are thinking of where to send your Christmas fundraising money, or you are thinking of adding a little extra in your recharter package, think of the "Cleveland Challenge-Round 2."

AAZK Administrative Office will send us a listing of Chapter donations after the 1 April deadline and we will match them up to \$5000. Let's keep AAZK, Inc. moving forward by supporting the Association's programs and projects.

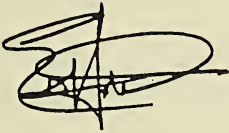


# From the Executive Director.....

During the annual conference in Cleveland, the Board of Directors ratified a proposal to formulate a new and exciting partnership with a private company in the name of rhino conservation. AAZK Inc., is proud to welcome and recognize the Blue Rhino Company as the sponsor of Bowling for Rhinos. This program shall now be known as The American Association of Zoo Keeper's Bowling for Rhinos, sponsored by Blue Rhino.

There are many benefits to this partnership, on the national, international and local levels. First and foremost, Blue Rhino has designated \$20,000.00 per year, for the next two years, to the Bowling for Rhinos programs. The funds will be spread over the three international rhino conservation groups that AAZK supports, in conserving five rhino species. At the national level, AAZK and Blue Rhino will work to promote the BFR program and rhino conservation in a joint marketing strategy. On the local scene, Blue Rhino has offered in-kind logistic support in the form of signage, banners, and coordination from the local distributors, in areas where BFR events are held each year.

AAZK is proud to welcome Blue Rhino as a partner in international rhino conservation. To obtain more information on how Blue Rhino might be able to help your local event, contact Patty Pearthree, BFR Coordinator.



Ed Hansen  
AAZK Executive Director  
Tucson, AZ



The Little Rock Zoo AAZK Chapter is now offering for sale  
*"Eat, Drink, and Go Wild"*

A spiral bound cookbook of recipes, photos, and animal facts.

Eight sections of great tasting ideas!

To order send \$10.00 plus \$4.00 shipping and handling to:

Little Rock AAZK Chapter, c/o Little Rock Zoo

#1 Jonesboro Dr., Little Rock, Arkansas 72205

For information: Daphne Brock, [dcbrock@att.net](mailto:dcbrock@att.net)

# Coming Events

**First Annual Crissey Zoological Nutrition Symposium** - 12-13 December 2003 in Raleigh, NC. To be held at the College of Veterinary Medicine, North Carolina State University. A website with details and registration instructions is posted at <http://www.cvm.ncsu.edu/info/ce/zoonutrition.htm>< Special sections this year will focus on Primate Nutrition, Food Safety, Fiber and Forages, Vitamins and Minerals; as well as general sessions. Dr. Jay Kaplan of Bowman-Grey Medical School will be the keynote speaker, speaking on "Phytoestrogens and Health: What Can We Learn from Primates? An evening event on 12 December is planned for the general public.

**II International Tapir Symposium** - 10-16 January 2004 - in Panama City, Republic of Panama. Will bring together a multi-faceted group of tapir experts, including field biologists, educators, captivity specialists, academicians, researchers, veterinarians, governmental authorities, politicians and other interested parties. Session topics will cover field research, population management, husbandry, fundraising, marketing, governmental regulations, eco-tourism, education, veterinary issues and tapir bio-politics. Visit the Symposium website at <http://www.caligo.com/tapir/> for more information and registration details.

**Karen Pryor Clicker Expos 2004**

23-25 January 2004, Berkeley, CA; and 26-28 March 2004, West Chester, PA. Each Clicker Expo will feature 15 main stage presentations and 18 workshops over three days. Topics will cover the latest operant conditioning techniques utilized for domestic as well as zoo and aquarium animals. For a full schedule and registration information, visit [www.clickertraining.com](http://www.clickertraining.com)<

**International Polar Bear Husbandry Conference**

4-7 February 2004 in San Diego, CA. Polar Bear International (PBI) in association with the AZA's Bear TAG are cohosting this conference to be held at the Bahia Hotel on Mission Bay. They are bringing together many of the most experienced and knowledgeable "bear" professionals in the world, including noted scientists, zookeepers, and naturalists representing a broad spectrum of institutions. Information and online registration is now available on PBI's website (<http://www.polarbearsinternational.org>). This includes the invited speaker list (updated monthly) as well

as the conference agenda, goals, scholarship information and other specifics. Any questions, please do not hesitate to call our headquarters at (225) 923-3114.

**International Association of Avian Trainers and Educators (IAATE)** - 18-21 February, 2004 in

Toronto, Canada. Hosted by the Toronto Zoo. For more information call (416) 392-6008 or email [kbuckle@sympatico.ca](mailto:kbuckle@sympatico.ca), [hamiltonk2000@rogers.com](mailto:hamiltonk2000@rogers.com)<

**AZA Western Regional Conference** - 17-20 March 2004. Hosted by Santa Barbara Zoo. For information contact Nancy McToldridge at (805) 962-5339.

**The Felid TAG Annual Conference Meeting** - 19-

21 March, 2004 in Albuquerque, NM. Hosted by the Rio Grande Zoo. For more information please contact Lynn Tupa at (505) 764-6216. [ltupa@cabq.gov](mailto:ltupa@cabq.gov)< or Gwen Dragoo at ((505) 764-6262, [gdragoo@cabq.gov](mailto:gdragoo@cabq.gov)<

**AZA Traveling Training** - 24-30 April 2004. To include Keeper Training Course. At the Houston Zoo, Houston, TX. Contact Alexis Weider, Training Administrator at (301) 562-0777, Ext. 256.

**AZA Eastern Regional Conference** - 12-15 May 2004. Hosted by Louisville Zoo. For information contact Sandra Allen (502) 238-5608.

**IX International Otter Colloquium** - 4-10 June, 2004 at Frostburg State University, Frostburg, MD. Theme is "Otters: Ambassadors for Aquatic Conservation". For more information go to <http://otter.frostburg.edu><

**2004 Gorilla Workshop** - 25-28 June, 2004 in Calgary, Alberta, Canada. Hosted by the Calgary Zoo. Look for more details and registration information as they become available at <http://2004gorillaworkshop.tripod.com><

**AAV 25th Annual Conference & Expo** - 16-20 August 2004 - in New Orleans, LA at the Sheraton New Orleans Hotel. For further information call (303)756-8380 or visit [www.conferenceoffice.com/aav](http://www.conferenceoffice.com/aav)<

**Post Your Coming Event Here - email to [akfeditor@zk.kscoxmail.com](mailto:akfeditor@zk.kscoxmail.com)**



# **AAZK Announces New Members**

## **New Professional Members**

Lynn Turcotte, **no zoo listed (Johnston, RI)**;  
Marianne Morrison, **The Philadelphia Zoo(PA)**;  
Carol Bokelman, **Popcorn Park Zoo (NJ)**; Kip  
Grangier, **Salisbury Zoo (MD)**; Karsten Jensen,  
**Mill Mountain Zoo (VA)**; Amy M. Haggard,  
Beth Philthroe, Kristina A. Krickbaum, Daryl  
Hood, Veola W. Lampkin-Herron, Rebecca  
Richardson, Sarah A. Jenkins, Shannon Richards,  
Brett Bannor, Ricca Ducharme, Heather Baskett,  
Cilinia Powell and Kelly Holt, **Zoo Atlanta (GA)**;  
Scott Gregory, **Santa Fe Community College  
Teaching Zoo (FL)**; Vanessa Hollowell,  
**Nashville Zoo at Grassmere (TN)**; Michele L.  
Giffen, **Akron Zoo(OH)**; Rickey Kinley,  
**Cincinnati Zoo (OH)**; Julie A. Elsinger, **Henry  
Vilas Zoo (WI)**; Anna M. Quaintance and Sarah  
L. Behrens, **Sunset Zoo (KS)**; Carl Jennings,  
**Peony Park (NE)**; Robin L. Culp, **Moody  
Gardens (TX)**; Carina Campbell, **Cheyenne  
Mountain Zoo (CO)**; Randall McKenney,  
**Tautphaus Park Zoo (ID)**; Teresa Riza and  
Heather J. Vetter, **The Phoenix Zoo(AZ)**;  
Jennifer Byram, **Arizona-Sonora Desert  
Museum (AZ)**; Traci Amerine, **Woodland Park  
Zoo (WA)**; Sara M. Mattison, **Point Defiance  
Zoo & Aquarium (WA)**; Rosalynn Tiller,  
**Colchester Zoo (UK)**.

## **Renewing Contributing Members**

Mark Hofling, Sr. Keeper  
Bronx Zoo (NYZS), Bronx, NY

## **Renewing Institutional Members**

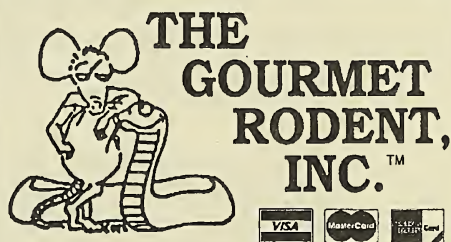
Michigan State University Library  
East Lansing, MI

Serials Dept./Ellis Library  
University of Missouri  
Springfield, MO

Dickerson Park Zoo  
Springfield, MO  
Mike Crocker, Director

Tautphaus Park Zoo  
Idaha Falls, ID  
William R. Gersonde, Director

Chaffee Zoological Gardens of Fresno  
Fresno, CA  
Ralph E. Waterhouse, Director



## **RATS AND MICE**

Bill & Marcia Brant  
6115 SW 137th Ave., Archer, FL 32618  
(352) 495-9024  
FAX: (352) 495-9781  
e-mail: GrmtRodent@aol.com

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## REACTIONS

### *A Question and Answer Forum for the Zoo Professional on Crisis Management*

*By William K. Baker, Jr., Curator  
Little Rock Zoo, Little Rock, AR*

#### **Question**

Do you have any recommendations for preventing human encroachment into a zoological facility?

#### **Comments**

Ideally there are two ways to look at the problem of human encroachment into a zoological facility and there are two ways to build strategies to prevent it. The two factors that determine a course of action are daylight and nighttime operations, and the two facets to develop a strategy are passive and active security.

#### ***Daytime – Passive Security***

- Traffic control of visitors should always be at the forefront of zoo design. Ideally you want to control not only where the public can and can't go, but also how they move through your facility. Traffic patterns should encourage a smooth transition through a zoological park.
- Graphics are an important component of identifying "staff only" and "restricted area" entry points into employee areas. Staff members should avoid shortcuts, which result in open or unattended gates or entry points. Gates should be secured whenever they are not in immediate use by the staff.
- Locks are a major component of any security plan. Ideally only staff members assigned to an area should have key access. Inspect all locks, chains, and deadbolts. Perform maintenance on an annual basis or as needed. Inferior quality or locks in poor repair should be upgraded and replaced. Perform a key inventory and develop a key control program that restricts key access.
- All staff members should be required to carry photo ID badges at all times while on duty. In larger facilities this is critical when considering the sheer number of employees at a given time. Staff members should always be in some level of issue uniform.
- All visitors should be required to physically check-in with a staff member and should be issued visitor ID badges. All staff vehicles should have a parking pass clearly visible on the windshield of the vehicle. Visitors should be issued a temporary parking pass. Temporary passes can be purchased in multiple colors and should be changed on a monthly basis.



### *Nighttime – Passive Security*

- Landscaping can be a real asset to the appearance of zoological facilities. However, it can also provide great cover for individuals hiding in the park or trying to enter after-hours. Landscaping should be maintained to allow a field of vision down a perimeter fence that will also facilitate visual inspections of the fence itself.
- All entry points should be secured at the end of the business day.
- All service areas, storage areas, and restrooms should be secured at the end of the business day.
- Area lighting is a vital component of night operations and no facility should be without it. Lighting at night along the perimeter should be the strongest followed by entry points into the facilities and the animal service areas. Ideally, all exhibits should have the ability to be lit in an emergency as well. Regular inspections and maintenance are key elements to maintaining this deterrent. Fluorescent lighting typically provides clean blue-white light and is energy efficient. One neat option that I have seen used are area lights powered with solar panels.
- Potential entry points would include storm drains, gaps in fencing, or fencing that is non-cyclone in nature. Storm drains should be grated and locked. Ideally perimeter fencing should be continuous, cyclone, at least eight feet tall, and preferably with a secondary perimeter fence line. The area between the fences should be kept landscaping-free. Also, always keep debris and material away from fencing, it makes a great improvised ladder.

### *Daytime – Active Security*

- Always introduce new members of the staff; it's not only courteous, it's good security. Encourage staff to "be aware" of unusual activity or people taking pictures with sensitive areas as a background.
- Unknown persons in restricted areas should be challenged and identified. Access to a facility by volunteers should be closely controlled and monitored.
- Staff members should be provided with a secure parking area located within the perimeter that requires coded access and has minimal gate access, (adequate lighting is a must at night).
- Uniform and non-uniform security can be an extremely effective element in deterrence and response and a reliable asset, provided they have been properly trained. Unarmed security elements are best used as a deterrent or for first aid. As a result, the use of armed peace officers or security guards would be more advantageous in a crisis.
- Biometric security measures, a relatively new aspect of security in the military and private sector, can be highly effective in unmanned access control. In short, it uses a discriminating physical characteristic, which it compares to its database. Historically expensive, but becoming more affordable. Still, swipe cards incorporating photo ID's are frequently used in the corporate work place and are an affordable alternative.

### *Nighttime – Active Security*

- After-hours access to a facility should be rigidly controlled. There should be a provision for sign-in/sign-out procedures with visual confirmation by the night staff.

- Consider the use of burglar bars and motion-sensitive security lighting near any administrative, laboratory, research, or veterinary service buildings
- Automated alarm systems can be effective when equipped with an alternate power source in the event electrical service is interrupted or fails. Monitored systems are best.
- Cameras and electronic surveillance range from inexpensive progressively to expensive, [conventional, telescopic, starlight (Generation I-III), and infrared (active and passive)]. It simply depends on the perceived threat level and what your budget can bear. Also, they are useless in the preventative sense without a staff member or service to monitor and interpret what they are seeing, (an additional expense). Still, it is a very time-effective approach to monitoring large areas of a facility.

While a combination of the suggestions listed above is an effective approach, the single best option in my experience is a human presence on grounds.

**Next Month:** What types of reference materials are available for crisis management?

**If you would like to submit a question for this column or have comments on previously published materials, please send them to AAZK, Inc., 3601 S.W. 29th St., Suite 133, Topeka, KS 66614 Attn: Reactions/AKF**

(About the Author: Since 1985 Bill has been active in the fields of science, zoology, and wildlife management. His education and experience include a B.S. in wildlife management and post-graduate studies in zoology, Lab and Museum Assistant, Shoot Team Leader, ERT Member, Large Mammal Keeper, Senior Keeper, and Zoo Curator at various zoological facilities. His area of research is crisis management in zoological institutions, which draws upon practical experience and training as a Rescue Diver, Hunter Safety Instructor, NRA Firearms Instructor, and Red Cross CPR/First Aid Instructor.)

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## **Polar Bear Meeting Scheduled for 2004**

Polar Bears International (PBI) in association with American Zoological and Aquarium Association's Bear Taxon Advisory Group (Bear TAG) is formally announcing the International Polar Bear Husbandry Conference to convene 4-7 February 2004 in San Diego, California at the Bahia Hotel on Mission Bay. We are bringing together many of the most experienced and knowledgeable "bear" professionals in the world, including noted scientists, zookeepers, and naturalists representing a broad spectrum of institutions.

Information and online registration is now available on PBI's Web site [www.polarbearsinternational.org](http://www.polarbearsinternational.org) <<http://www.polarbearsinternational.org/>> . This includes the invited speaker list (which will be updated monthly) as well as the conference agenda, goals, scholarship information and other specifics. Any questions, please don't hesitate to call our headquarters at (225) 923-3114. Source: *Robert W. Buchanan, President, Polar Bears International, (813) 503-8887; robearbuck@aol.com*



# ABC's

## ABC's: Animal Behavior Concerns and Solutions

*A Question & Answer Forum for Animal Professionals*

©2003 by Diana Guerrero, Independent Behavior Consultant  
Ark Animals of California, Big Bear Lake, CA



**Behavior Evaluation:** Integration of *Zalophus californianus* and *Phoca vitulina*.

**Question:** (*American Zoo*) We would like to integrate two species of pinnipeds into the same enclosure. What do you suggest?

**Answer:** Co-habitation of multiple species, especially different pinnipeds, is fairly common. Integration success, or challenges, will depend on the individuality or idiosyncrasies of the animals and may be influenced by the gender ratio, diversity in ages, seasonal influences, and the exhibit specifics.

Many different zoos and aquariums have reported success housing California sea lions (*Zalophus californianus*) and harbor seals (*Phoca vitulina*) together. In some cases training was necessary, while in others the animals adapted to the change in environment without tremendous problems.

Since the established group already performs basic husbandry and show behaviors—and you have stated that you are also currently training the younger animals, it sounds like you are well on the way to successful integration.

Strong stationing behaviors, targeting control for movement, separate feeding stations, and adequate haul-out areas for the animals will help prevent altercations. In addition, make sure you continue to provide adequate training criteria and present environmental enrichment stimulation to keep the animals physically and mentally occupied.

Competition for haul-out space is one of the bigger challenges you may encounter. Prior assessment of your exhibit and creative solutions to address the space issue will help you avoid aggressive animal exchanges. However, as the younger animals begin to mature, you may see hierarchical shifts and challenges that may escalate during the breeding season.

Before the actual integration you may want to allow each group of animals to be in the primary enclosure at different times so that the new group acclimates prior to introduction. This allows the

new animals to be familiar with the exhibit and to use that familiarity as an advantage should they need it. Once acclimatized, it is ideal to expose each group of animals to the others under controlled circumstances.

Controlled situations where barriers are used (gates, etc.) allow visual, olfactory, and auditory exposure to other animals without the jeopardy. You can allow the animals opportunities to interact devoid of risk by using both land and underwater barriers (nets) or gates. If you have the capability, keep each group of animals on one side of the exhibit one day and then switch the sides they occupy on the next day. During this process have a trainer work with each animal (or group of animals) and move them closer until they are working in close proximity to one another.

Approximation would continue so that you eventually begin working the groups within the same areas. First you would work them in adjacent areas, then the same areas but separating them prior to the end of the session. Next you would end the sessions (with each group) within the same area so they can intermingle freely after the sessions.

In most cases the animals will sort out their situation or status within their group with low levels of threat behavior. They will either ignore each other or tolerate the presence of the others. In some cases, the younger animals will catalyze increased activity levels and stimulation for the group. Finally, remember that it never hurts to have some sort of contingency plan in place to address any major altercation should one occur.

About the columnist: Since 1978 Diana L. Guerrero has worked professionally with both wild and domestic animals. Guerrero has been affiliated with and certified by a variety of animal programs in the USA and Europe. Based in California, she writes, consults, and leads safaris. Information on her animal career programs, training courses, and her newest book, *What Animals Can Teach Us About Spirituality* (SkyLight Paths, 2003) are available through her website. Questions for ABC's should be submitted to Diana directly through the ABC's questionnaire on her website, via email (zooit@arkanimals.com), or through regular mail: c/o ARKANIMALS.COM, PO Box 1989-215, Big Bear Lake, CA 92315 USA.

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## Great Ape Quiz

We are making a program about the great apes and have an online quiz to accompany it. We would like as many people as possible worldwide to take our quiz, so that we can find out how much people know about the great apes and some of their opinions about them. There will soon be a prize incentive on the site, so look out for that!

Please log on at <http://www.tigressproductions.co.uk> and take our Great Ape Quiz! And please forward this information on to as many of your friends, family and colleagues as you can.

Submitted by Jessica Tombs, Tigress Productions Ltd., email: [jtombs@tigressbristol.co.uk](mailto:jtombs@tigressbristol.co.uk)





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# Book Review

## New York's Biggest Little Zoo: A History of the Staten Island Zoo

By Ken Kawata

Copyright 2003 Staten Island Zoo ISBN 0-7575-0178-8

Kendall Hunt Publishing Company, 4050 Westmark Dr.,

P.O. Box 1840, Dubuque, IA 52004-1840

1-800-228-0810 or [www.kendallhunt.com](http://www.kendallhunt.com)

Also available at [amazon.com](http://amazon.com)

193 pp. Paperback \$20.00

*Review by Judie Steenberg  
Retired Zoo Keeper  
Minneapolis, MN*

In this book, Ken Kawata makes history interesting. Although *New York's Biggest Little Zoo* was written for the general reader, collectors of zoo history, reptile enthusiasts and zookeepers will all learn something about their field of interest from this book. Part One "It Began with a Dream" through Part Six "Waves of the Future" take the reader from the early 1930s through the trials and tribulations in the development of a zoo.

"At the bottom of the Great Depression, a small zoo was born on Staten Island, New York City." The Staten Island Zoo (SIZ) was a different zoo from the start; it would be the first zoo to emphasize education as its primary role. "The Zoo will be helpful to our students in the study of nature and natural sciences." That statement was made in 1936 during the Dedication of the SIZ. The main zoo building was designed, and built, with an auditorium, office and laboratories. Throughout the book, the author relates the many ways the SIZ was used as an education facility, even during the lean years, despite the fact that education staff wasn't hired until 1970.

This 193-page book is loaded with historical bits about New York and America as they relate to the founders and development of the SIZ. The author describes those most difficult years of animals arriving with no space and no timeline on constructing the buildings, attendant with budget woes. Still, the SIZ became a reality with a strong emphasis on reptiles, another departure from zoo tradition. The SIZ, although a small zoo, contained one of the most extensive and representative collections of reptiles in the country. In the mid-1940s the zoo had regularly scheduled snake feedings; a controversial practice most zoos avoided. Reptile enthusiasts will especially enjoy the chronology of the SIZ's reptile collection.

Dr. Patricia O'Connor, "...the first full-time woman zoo veterinarian in the country" started working at SIZ in October 1942. It was also a surprise to learn that she was only one of six staff zoo veterinarians in the country in 1955. The author emphasizes the significance of Dr. O'Connor's position, the variety of "hats" she wore, and tells of her remarkable work and contributions to the zoo profession. Networking was Dr. O'Connor's forte and the AAZV was her brainchild; she was the organization's first president (1946-57).

Throughout the book, the author brings to light the complexities of a zoo, the diverse duties of zoo staff, the vagaries of zoo management and "new" concepts in zoo operations. The author describes a downturn at SIZ in the 1970s due to "severe financial difficulties and lack of strong leadership; it was "...an age of isolation". From 1980 – 2002, "Under new leadership, the Zoo entered an era of recovery and development." *New York's Biggest Little Zoo* is an interesting book that covers the good times as well as the difficulties a zoo goes through. Ken makes one want to visit this *big little zoo*.



## **Biology, Husbandry, and Medicine of the Green Iguana**

Edited by Elliot R. Jacobson, DVM, PhD, DACZM

Copyright 2003 ISBN 1-57524-065-3

Krieger Publishing Company, P.O. Box 9542, Melbourne, FL 32902-9542

216 pp., 103 color plates, 30 b/w photos Hardcover/\$46.50

*Review by Sandra C. Wilson, DVM, MS  
Veterinarian  
Sedgwick County Zoo, Wichita, KS*

There is relatively little information regarding husbandry and medicine that can be applied across the board to all reptiles. This is the first textbook to provide accurate, in-depth, and very useable information on a single species. No one is more qualified to serve as editor than Elliot Jacobson is, and the list of contributing authors is impressive.

The first three chapters are devoted mostly to the biology and nutrition of wild green iguanas. Not only is this fascinating reading, but the information is applicable to captive management, particularly in the zoo environment where well-designed exhibits and social groupings can foster the expression of natural behaviors. Although much of this information has been published previously in a variety of journals, it is now much more accessible to zoo personnel and veterinarians.

Chapters 4 and 5 cover husbandry and nutrition of captive iguanas. Minor differences of opinion between authors are noted, for example regarding the use of processed foods and the inclusion of fruit in the captive diet. These differences of opinion are entirely appropriate in an multi-authored text, particularly when much remains to be learned on the subject of iguana nutrition. The discussion of ultraviolet light is detailed, and highlights the problems encountered when attempting to provide adequate UV through artificial means. However, the recent use of high power UVB emitting lights, such as the mercury vapor lamp, is not discussed.

The remainder of the text covers various aspects of iguana medicine, including diagnostic techniques, drug dosages, and surgery. As a clinical veterinarian, I was particularly interested in the chapter on diagnostic imaging. Some of the images are of other species, and images of contrast studies are not included. Perhaps in the next edition, this chapter could be expanded to include more radiographic and sonographic images.

There are a little over 100 color plates included in the text. A few are redundant or of limited value, but the overall quality and usefulness is exceptional. The text is well-referenced, with several chapters listing over 100 references. The chapter summaries are particularly useful, especially following lengthy and detailed chapters. However, only a few chapters contain summaries.

Zoo personnel, herpetoculturists and veterinarians will find this book very useful. We can only hope that similar high quality texts covering other (single) species will be published in the near future.

## **Nests, Birds and Incubators New Insights into Natural and Artificial Incubation**

By D. C. Deeming

Copyright 2002, ISBN 0-9544-0670-2

Brinsea Products Ltd. Station Rd., Standford, N. Somerset, BS25 5RA, United Kingdom

Printed by Oxford Print Centre, 36 Holywell Street, Oxford, OX1 3SB, United Kingdom

209 pgs. paperback Price: 20£

*Review by Leslie Keys, Principal Keeper,  
Detroit Zoological Institute, Royal Oak, MI*

The author of this book previously wrote the book "Avian Incubation: Behavior, Environment & Evolution" (Oxford University Press, 2002) to provide the scientific community with a reference

book for years to come. The book "Nests, Birds and Incubators" presents the same material in a more easy-to-read format. He also put the concepts of artificial incubation and natural incubation together to provide insight into the similarities and differences of these two divergent methods. In his goal of making a book readable to non-scientists I would say he was a rousing success. When I received this book for review, I sat down with it to briefly leaf through and ended up spending over an hour reading bits and pieces. It was extremely hard to put down.

Deeming arranges his book into two sections. The first deals with birds in the wild, their nests, their eggs, and their behavior. He discusses the mechanics of incubation and how the structure of the nests and the ambient environment affects the structure of eggs themselves. For example, birds that live in arid regions lay eggs with very low-porosity shells to slow down weight loss and birds like grebes that nest in the water lay eggs with very high porosity. In addition, birds living in lower altitudes lay eggs with low porosity eggshells, but when the same birds are moved to higher altitudes, they begin laying eggs with higher porosity to counteract the effects of air pressure on the rate of gas exchange. He also goes into details of exactly how eggs are formed, what their internal structure consists of and why this is so important to understand in relation to artificial incubation. One of the most interesting facts in this section concerns eggshell strength. The larger the surface area of an egg, the thinner the eggshell. This means that although an ostrich egg is still plenty thick enough to withstand an ostrich sitting on it, a tiny egg like a finch's has a proportionately thicker shell. This also means that a very small egg can afford to lose some shell thickness without breaking. This explains why flycatchers and warblers were able to come through the DDT crisis while larger birds like eagles and osprey were so adversely affected.

The second half of the book is devoted to artificial incubation. He explains the reasons for artificial incubation, how incubators are supposed to work, how various methods are used to achieve the conditions needed to successfully incubate eggs and what may have gone wrong if there is hatching failure. The best part of this section gives descriptions of hatch failures and exactly what went wrong and when in the cycle it happened. Then he offers suggestions as to how to correct the problem. This makes it much easier to correct the problem rather than changing everything in hopes that something works, or changing everything one at a time and sacrificing many hatches.

The last chapter introduces a new type of incubator that more closely mimics natural incubation by applying the main heat source directly to the egg in the form of a bubble of air. This method can create the temperature gradient found in all naturally incubated eggs. It also incorporates the natural cooling of eggs during turning.

There is no question that I would highly recommend this book to anyone who is involved in breeding birds, whether they are using artificial or natural incubation methods. Besides being full of practical information and usable advice, it's a darn good read.



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# Legislative Update

Compiled by Georgann Johnston  
Legislative Advisor  
Sacramento, CA



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## Tibetan Antelope Proposed for Listing as an Endangered Species

In response to a petition submitted by the Wildlife Conservation Society and the Tibetan Plateau Project of the Earth Island Institute, the U.S. Fish and Wildlife Service (USFWS) determined that listing the Tibetan antelope (*Pantholops hodgsonii*) as endangered under the U.S. Endangered Species Act is warranted and published a listing proposal in October 2003.

Tibetan antelope or “chiru,” is native to the Tibetan Plateau in China as well as small areas of northern India and western Nepal. As recently as 40 to 50 years ago, between 500,000 and 1,000,000 Tibetan antelope may have roamed the Plateau. Today its numbers have declined precipitously and could be as low as 65,000- 75,000 individuals.

Tibetan antelope populations are declining principally because large numbers of animals are being killed illegally for their wool, known in the international marketplace as “shahtoosh” or “king of wool.” Shahtoosh is considered to be one of the finest animal fibers in the world and, since the 1980’s, expensive shahtoosh shawls and scarves have become high fashion status symbols in the west. This international commercial demand for shahtoosh has, in turn, brought about sharply increased poaching and fuels a lucrative illegal trade which continues to thrive despite conservation and enforcement efforts by the Chinese government. Tibetan antelope are always killed to collect their wool. No cases of capture-and-release wool collection are known, nor is naturally-shed wool collected from shrubs and grass tufts for use as is often erroneously stated, primarily by people within the shahtoosh trade. Wool is smuggled from China to the states of Jammu and Kashmir in India, where it is woven into expensive high-fashion shawls and scarves and subsequently exported illegally to the principal markets in the U.S. and Europe.

Since 1979, international commerce in shahtoosh and shahtoosh products has been prohibited by virtue of the species’ listing in Appendix I of the CITES agreement. It is illegal to commercially import shahtoosh products into the United States. Listing the Tibetan antelope under the Act would prohibit the sale or offering for sale of shahtoosh products in interstate or foreign commerce. This would give U. S. prosecutors additional means of fighting shahtoosh smuggling and the illegal market within the United States. *Source: USFWS Press Release 7 October 2003*

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## Rules for Managing Double-Crested Cormorants Issued by USFWS

The U.S. Fish and Wildlife Service (USFWS) recently released a Final Rule and Record of Decision that will allow more flexibility in the control of double-crested cormorants (*Phalacrocorax auritus*) in areas where they are causing damage to aquaculture and public resources such as fisheries, vegetation, and other birds.

The rule expands the aquaculture depredation order, which has been in place in 13 States since 1998, to allow USDA Wildlife Services (USDAWS) to conduct winter roost control. It also establishes a public resource depredation order to allow state wildlife agencies, Native American tribes and the USDAWS to conduct cormorant control for the protection of public resources in 24 States (mostly in the South and on the East Coast of the U.S.). Without these depredation orders, agencies and individuals would need a federal permit to control cormorants.

Double-crested cormorants are colonial waterbirds whose numbers have increased substantially in the past 30 years. They can cause localized, but sometimes significant, negative impacts on resources such as commercial aquaculture, recreational fisheries, vegetation, and the habitat of other colonial nesting birds. "Since cormorants cause localized impacts to natural and economic resources, we believe local management is the best approach to reduce conflicts," said Service Director Steve Williams. Agencies acting under the depredation order must have landowner permission, may not adversely affect other migratory bird species or threatened and endangered species, and must satisfy annual reporting and evaluation requirements. The Service will ensure the long-term conservation of cormorant populations through annual assessments of agency reports and regular population monitoring.

The rule also modifies the 1998 aquaculture depredation order to allow control of cormorants at winter roosts near fish farms and to allow fish hatcheries to protect their stock from cormorant predation. This added authority applies only to the original 13 States and, in the case of roost control, may be conducted only by officials of USDAWS.

While cormorant populations were dramatically affected by such things as the pesticide DDT, today the population is at historic highs in many areas due in large part to the presence of ample food in their summer and winter ranges and reduced contaminant levels. The total estimated population of double-crested cormorants in North America is approximately two million birds. *Source: USFWS Press Release 8 October 2003*

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### **"Birding in the United States" Report Released by USFWS**

A new federal economic report found that 46 million birdwatchers across America spent \$32 billion in 2001 pursuing one of the Nation's most popular outdoor activities according to a report from the USFWS. The report, titled "Birding in the United States: A Demographic and Economic Analysis," is the first of its kind analyzing data from the 2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation.

"Nearly one in five Americans is a bird watcher," said Service Director Steve Williams. "This report recognizes what we always thought to be true. Birdwatching is very popular and contributes greatly to our economy, so it is important that we continue to work with our partners to restore and protect habitat to ensure healthy bird populations."

Montana, Vermont and Wisconsin led the Nation in birding participation rates as a percent of total state population. California, New York and Pennsylvania had the most birders. Birders spent \$32 billion on gear such as binoculars, travel, food and big ticket items such as canoes, cabins and off-road vehicles. This spending generated \$85 billion in overall economic output and \$13 billion in federal and state income taxes, and supported more than 863,000 jobs. To be considered a birdwatcher, an individual must take a trip a mile or more from home for the primary purpose of observing birds or must closely observe or try to identify birds around the home. Those who notice birds while mowing the lawn or picnicking at the beach were not counted as birders. Trips to zoos and observing captive birds also did not count as birdwatching. Watching birds around the home is the most common form of bird-watching. Taking trips away from home counted for 40 percent (18 million) of birders. *Source: USFWS Press Release 21 October 2003*

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### **Chinese Officials Seize Illegal Fur**

A record seizure by Chinese customs officials of 1,276 smuggled wild animal skins occurred in mid-October 2003. The skins have been obtained illegally by killing 32 tigers, 579 leopards and 665 otters. Three people from Tibet and two from Nepal were arrested on the Tibetan side of the border when they attempted to transport the skins by truck from Nepal into Tibet, using a mountain pass.

Officials estimated the value of the fur to be \$795,000 (US) and that the pelts were destined for use in high fashion apparel. This was the largest single seizure in Tibet since 1951 and was the largest ever single haul of tiger and leopard skins.



A study conducted in 2002 by the Wildlife Trust of India (WTI) concluded that most of the big seizures of illegal wildlife skins in northern India involved Tibetan traders. Only one of the traders identified by the WTI study has been apprehended.

“The total tiger and leopard skin seizures recorded in our database that have Tibetan connections pales into insignificance compared to this latest seizure,” said an official of WTI. “The problem is far graver than we had imagined. Otter skins are consumed in large quantity in Tibet itself and our database goes back showing a huge trade.” WTI believe that many of the skins seized in the China action originated in India. “Though this seizure is a matter of great success for Chinese authorities, it is also a reminder that enforcement of wildlife laws needs a complete overhaul in India and also in Nepal,” the WTI stated. *Source: Wildlife Trust of India Press Release 21 October 2003*

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### **Proposed U.S. Policy Change Threatens Endangered Animals**

The USFWS is proposing a number of changes to its policy on the regulation of trade in endangered species. The changes would allow hunters, circuses and the pet industry to kill, capture and import animals that are highly endangered in their native habitats to be imported for commercial use in America. The USFWS is calling the proposal an “enhancement of survival” plan and claim that the changes would help other countries create stronger wildlife and habitat programs.

Authorities from the USFWS said that money spent by circuses, pet industry companies, and even zoos to import these endangered species could be used to support conservation projects abroad. No species native to the United States is subject to the proposed rule changes. Species included in the proposed new plan include Asian elephants from India, Southeast Asia and China; the Morelet’s crocodile from Mexico; the wood bison from Canada; and the markhor from Pakistan. Additionally, the pet industry would also be allowed to import blue-fronted Amazons from Argentina.

Kenneth Stansell, assistant director for international affairs of the USFWS said that the current Endangered Species Act provides poor countries no incentive for protecting dying species. Opponents to the plan rebut this by pointing out that foreign countries and groups that stand to profit would be in charge of determining how many animals can be killed or captured. They also say opening the door to legal trading and importing would encourage poaching. *Source: Oakland Tribune Online 16 October 2003*

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### **Hong Kong Customs Officials Seize Two Tons of Tanzanian Ivory**

Hong Kong customs officers seized nearly two tons of illegally imported ivory, worth about 2.7 million Hong Kong dollars (\$346,200 US), and arrested three people, a spokesman said on Tuesday. The three were arrested while trying to drive the 1,932 kg (4,250lbs.) of ivory from a shipyard in two containers, a customs and excise spokesman said. They had declared the ivory, believed to be from Tanzania, as 300 pieces of wood carvings imported from Malaysia. The import and trading of ivory are banned in Hong Kong after a worldwide moratorium on such trade declared in 1989 by the Convention for International Trade in Endangered Species (CITES). Hong Kong has historically played a major role in the global ivory trade. According to customs statistics, from 1979 to 1988 Hong Kong was the leading re-exporter of raw ivory. *Source: ZooNews Digest #269 15-22 October 2004*

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### **Jaguar Documented in Southern Arizona**

A remote surveillance camera has photographed a jaguar (*Panthera onca*) in southern Arizona, the second such documentation of the species in the state in last two years reports the USFWS. Surveillance cameras have been in use since 1997 to monitor potential travel corridors since 1997. The Service will “continue to monitor the area and try to determine if the animal has established a territory or is a transient.” The jaguar was listed as endangered in 1997 and the closest known jaguar population is in Mexico, some 135 miles south of the border. Since 1900 there have been 60 documented jaguar sightings in Arizona and the number to report a sighting to the AZ Game & Fish Dept. is (602) 789-3573. *Source: GREENlines Issue #1978 10-27-03*

# An Intern's Enrichment

By Craig Quinlan, Zookeeper Intern  
Houston Zoo, Inc., Houston, TX

This summer, May-August of 2003, I was hired as an intern with the carnivore department at the Houston Zoo. The internship was sponsored by ExxonMobil through their Community Summer Jobs Program. When I was started, I was told that my job would be to help develop the enrichment program in the department. Initially I thought, "Cool. I will be building big toys for the animals to play with." Little did I know that enrichment encompasses much more than constructing complex play things. Enrichment can be as simple as hiding an animal's diet in difficult to reach places, or as drawn out as altering the animal's entire exhibit. Not only does enrichment always keep an animal thinking and problem solving, it becomes a problem solving exercise for the keeper as well. This paper will discuss the methods by which I helped in the improvement of the enrichment program in the carnivore department at the Houston Zoo, and the enrichment that I received on the side.

It took me a little while to learn the rules of enrichment, but after working with the keepers for a few weeks, and reading papers on enrichment, I learned a few guidelines to follow. These rules are not written in stone, and each zoo probably has its own way of doing things, but these are the regulations that I have locked in my mind:

- Continually rotate the types of enrichment that you are using (i.e. social, feeding, thinking, sensory, exercise, and any combinations of these).
- Do not allow enrichment to stay on exhibit for more than two consecutive days.
- Always be thinking of new and better way to challenge your animals.

All of these rules guide the goals of enrichment; keeping your animals sharp and thinking while encouraging natural behaviors. After all, if these animals are to live in a man made enclosure, it is our responsibility to provide them with an enriched environment to stimulate them physically and mentally.

After learning the basics to carnivore zookeeping, I began to think about building large toys that could be shared between the large cats at the

Houston Zoo. I wanted to build items that were not easily destroyed, but would keep the cats interested for long periods of time. That seems like an easy enough mission, until one realizes that a 450-pound Siberian Tiger (*Panthera tigris altaica*) can destroy nearly anything constructed by a human. After much brainstorming I began to borrow ideas from such items as a sea lion toy and adapting it to a floating feeder (Fig. 1), to a child's mobile and using that concept for a big cat mobile (Fig. 2). The floating feeder (Fig. 1) is constructed from 1.5" PVC and plastic backing. It is strong enough to survive a night with a tiger, but light enough to float. The big cat mobile (Fig.2)

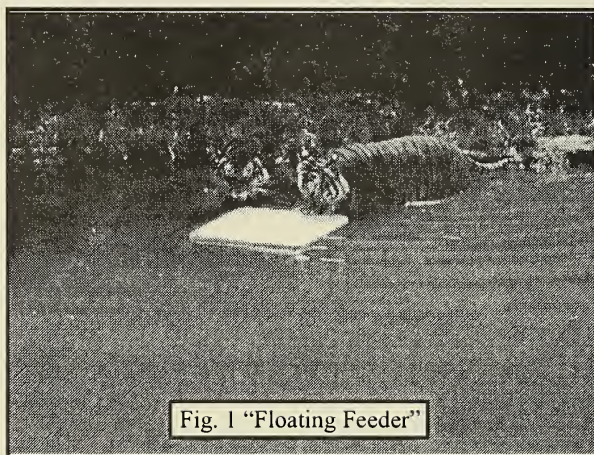


Fig. 1 "Floating Feeder"



gives a great deal of physical and visual stimulation and is relatively easy to construct. The top is from a wooden spool and chains are hung holding different toys. These objects proved to be quite versatile in that they could be moved from exhibit to exhibit relatively easily. Moving the toys added another wonderful aspect of enrichment to them. When a lioness smells the scent of a tiger on a new object in the yard it makes her really think about who or what has been in her area and what to do with this thing that has been left behind. However, I soon discovered, fun, sturdy and safe are not the only considerations to take into account when building an enrichment item. Maintaining a natural look comes into play whenever an item is going to be placed on exhibit. Whether it be a creative paint job (Fig. 3), or just an overall naturalistic look, creating the idea that the toy looks like part of the exhibit is key for the overall appearance of the zoo.

Building large toys is a fun and important part of carnivore enrichment, but it is only the tip of the enrichment iceberg. As stated before, these animals need social, feeding, thinking, sensory and exercise enrichment. These needs can be fulfilled by several different methods and objects from feeding out cow bones, to spraying scents, to giving the cats phone books to tear up. These are only a few everyday enrichment items and there are many more yet to be thought of. However, it is easy for a busy keeper to sometimes fall into a pattern of using the quickest form of enrichment frequently instead of creating something new. This is the issue with which the second part of my summer project is concerned. In order to make it easier on keepers we began to design an enrichment calendar that makes it simple for a keeper to just look at the wall and see what an animal needs each day. The calendar is designed to rotate enrichment categories and items as much as possible, while allowing the keeper freedom to introduce new enrichment items. The days on the calendar are labeled with enrichment categories, and at the bottom of the calendar will be a list of acceptable items for each category. For example, on a food enrichment day, a keeper can give meatballs, fish, bones, or any other form of food enrichment.

One of the best things about enrichment is that the more creative you are the better. One day you may be stumped for ideas, whereas the next you are an enrichment genius. As long as you vary your enrichment routine and introduce new, exciting, mind-challenging puzzles for your animals, they will be more active and healthy. Not many students get this kind of opportunity and I feel I made a worthwhile contribution to the carnivores of the Houston Zoo. I would like to thank ExxonMobil for their support of my internship and the Houston Zoo for allowing me the opportunity to do this project.

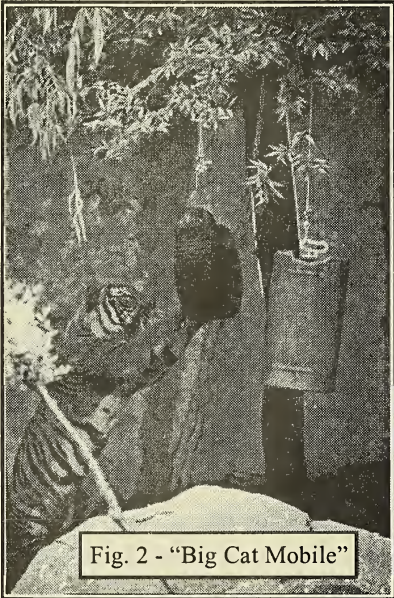


Fig. 2 - "Big Cat Mobile"



Fig. 3 - "Naturalistic PVC"

# The Water Column

By

*Dan Conklin, Senior Biologist, Florida Aquarium*  
*Bruce Elkins, Curator of Waters, Indianapolis Zoo*  
*Kevin Shelton, Associate Curator, Florida Aquarium*

It is with mixed emotions I open the final article for the Water Column. While on one hand I won't miss the deadlines, I will miss the opportunity to share with those of you interested in water and water quality. I know Dan and Kevin feel the same. I do want to offer that I will still be available to answer any questions you might have on water quality or aquariums in general at [belkins@indyzo.com](mailto:belkins@indyzo.com).

While Dan, Kevin and I have spent the last two years talking about methods for caring for, cleaning and monitoring water, we never gave a proper introduction to water as the life giving fluid it is. I would like to take this opportunity now.

To get a little physics out of the way:

Water is a simple molecule made up of two hydrogen atoms weakly bonded to an oxygen atom. It has bipolar characteristics that allow it to be strongly attracted to other water molecules to form a liquid substance at standard temperature and pressure. Water is also one of the few substances to be able to exist in any of three phases (gas, liquid, and solid) at the temperature and pressure ranges common on the Earth's surface. It is very abundant on the planet's surface and covers ~ 7/8 of the surface in either a freshwater, or sea water form. It has chemical and physical interactions with almost all other substances and is nicknamed the "universal solvent".

Water is defined in the **Merriam-Webster's Online Dictionary** as:

"...the liquid that descends from the clouds as rain, forms streams, lakes, and seas, and is a major constituent of all living matter and that when pure is an odorless, tasteless, very slightly compressible liquid oxide of hydrogen  $H_2O$  which appears bluish in thick layers, freezes at  $0^{\circ}C$  and boils at  $100^{\circ}C$ , has a maximum density at  $4^{\circ}C$  and a high specific heat, is feebly ionized to hydrogen and hydroxyl ions, and is a poor conductor of electricity and a good solvent". A rather short definition for a substance that impacts everything we do and are, but mixed in that definition are clues to the importance of water.

The first statement "...the liquid that descends from the clouds as rain, forms streams, lakes, and seas..." may be self-evident (especially in Indiana, in mid-fall) but we all know the importance cannot be overstated. Our food, our lives, the lives of the animals in our care, their food and all life depend on the availability of water, and nature's ability to move it around. (If that statement sounds weak, I ask that you think for a minute of what I am trying to describe!) While life can and does



exist in situations where water is very limited, that life has adapted to conserve the fluid, or its life cycle is rewired to fit water availability.

If we combine the second statement with the last “... a major constituent of all living matter and that when pure is an odorless, tasteless... and a good solvent”, we begin to understand why this “Water Column” exists. While pure water is essential for us, its abilities as a solvent make it the “major constituent of all living matter”. For life water must be able to carry all the organic and inorganic compounds vital to our existence. At the same time, this ability makes water the best vector for most toxins, bacteria, viruses, and other disease pathogens. Think of all the disease outbreaks from polluted water supplies in human history, and all the efforts that have gone into ensuring clean water sources. The very processes of life produce toxins, but nature has methods to clean our water, if we don’t over tax it. Several articles in this series have been devoted to Biological Filtration (our buzz phrase for this natural process of toxin removal) and biological filtration has been mentioned numerous other times as well.

The rest of the definition could fill volumes of printed material (and does) to underline the importance of water on our lives. But, I would rather finish with a brief story.

My Father and I have always been fishing buddies for as long as I can remember. We have spent hours together sitting on creek banks, sitting in boats watching our lines, even one very cold night stuck on a sandbar looking for our aquatic friends. For eight years I took fish and aquatic life for granted. Of course animals lived in the water, why else would we be fishing?

Then on a quiet evening, on a very calm Minnesota lake, an inquisitive eight-year-old woke up.

“Dad, how can fish live in the water?”

A simple question but my father’s short answer was anything but.

“Well son, it would be easier to answer how anything can live without water.”

That one statement led me to a life, and career, intimately involved with water and the life it supports.

Thank you for your readership.

## MOVING?

Please let us know when you change your address! It now costs AAZK 99 cents every time an *AKF* is returned because of an incorrect address. Call 1-800-242-4519 (U.S.) or 1-800-468-1966 (Canada) or e-mail [aazkoffice@zk.kscoxmail.com](mailto:aazkoffice@zk.kscoxmail.com) to report your new address.

# Chapter News Notes

## St. Louis AAZK Chapter

This newly chartered AAZK Chapter adopted a logo created by Ethan Schniedermeier in July of 2003.

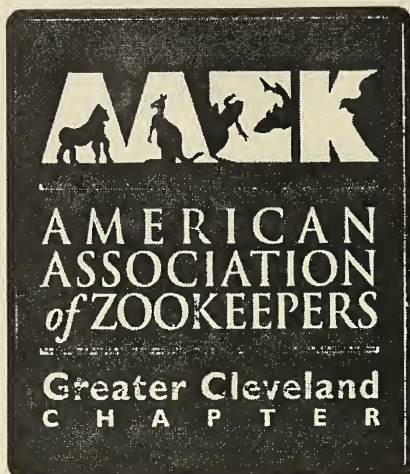
The Arch is the Gateway to the West and a symbol of St. Louis that is recognized nationwide. The Lesser Kudu and the Wolf represent the two organizations involved in the St. Louis AAZK Chapter - the St. Louis Zoo and the Wild Canid Survival and Research Center. The Lemur is a sign of the groundbreaking conservation efforts that the St. Louis Zoo has been involved in with this species.

*--Sarah Christeson, Liaison*



## Little Rock AAZK Chapter

The Little Rock AAZK Chapter is now offering a spiral bound cookbook filled with recipes, photos, and animal facts. To order send \$10.00 plus \$4.00 s&h to the Little Rock AAZK Chapter, c/o the Little Rock Zoo, #1 Jonesboro, Drive, Little Rock, AR 72205.



## Cleveland AAZK Chapter

Cleveland AAZK is selling "Strange Situations, Wild Occupations" cookbooks. We understand that some of you missed out at the conference. Here's another chance. Send \$15 (includes shipping price) payable to Cleveland AAZK to receive 300 recipes compiled by our zookeepers, volunteers, and friends. Send checks to: Cleveland Zoo, Attn: Debbie Kuscevic, 3900 Wildlife Way, Cleveland, OH 44109.

## **REMINDER**

Chapter Recharter packets will be mailed in January. They are due back at AAZK Administrative Office no later than **1 March 2004** in order to avoid a \$100 late fee. If you have questions contact Barbara Manspeaker at 1-800-242-4519 (US); 1-800-468-1966 (Canada) or email at [aazkoffice@zk.kscoxmail.com](mailto:aazkoffice@zk.kscoxmail.com)

**What's your AAZK Chapter been up to?  
Send your Chapter News to the Editor at:  
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# Starting an Injection Training Program with Lion-tailed Macaques (*Macaca silenus*)

*By Rana Bayrakci, Keeper  
Woodland Park Zoo, Seattle, WA*

## **Background**

Lion-tailed macaques (*Macaca silenus*) are highly endangered primates, found only in the rainforests of the Western Ghat Mountains in southwestern India. Woodland Park Zoo (WPZ) in Seattle, Washington, has a long history of managing this species. WPZ's first lion-tailed macaques arrived in the 1960s. To date, more than 50 lion-tailed macaques have been born at WPZ, and 5.3 lion-tailed macaques are currently maintained in the Trail of Vines exhibit in the Tropical Asia Bioclimatic Zone. Additionally, the late WPZ keeper Laurence Gledhill was the original studbook keeper for the North American and International lion-tailed macaque studbooks, as well as the American Zoo and Aquarium Association's (AZA) Species Survival Plan (SSP) coordinator, from 1982 until 1998.

WPZ's macaques are considered surplus by the SSP and are not recommended for breeding because their genes are over-represented due to successful reproduction in the 1970s and 1980s. The macaques are housed in five different groups: 1.2 troop, 1.1 troop, and three solo males. Unfortunately, there are not enough females for three of our male macaques to have companionship. There are six interior holding cages and three exterior holding cages, all constructed of concrete and 1" chain link fencing, and off public view. Each indoor holding allows the animals to have visual contact with other macaques across a 5' wide (1.5m) service hallway. The macaques are rotated between these off-view cages and the exhibit.

In 1932, macaques were identified as potential carriers of the Herpes B virus (CDC, 1987). This virus is potentially lethal to humans if left untreated, although not so for macaques (CDC, 1987; Cranfield and Bielitzki, 1995). Macaques that are Herpes B positive may present with lesions on the mouth, face, or genitalia, but most commonly they exhibit no symptoms whatsoever (Cranfield and Bielitzki, 1995). It wasn't until the 1980s that Herpes B became a serious concern for animal workers. Four primate lab handlers died from the virus in 1987, which was apparently contracted from macaques. Then, the Center for Disease Control and Prevention (CDC) developed a protocol to reduce potential handler exposure to Herpes B (CDC, 1987). WPZ adopted such a macaque handling protocol in 1998. In 2000, the AZA also recommended that zoos develop a protective protocol (Janis Joslin, personal communication).

Therefore, anyone working with the species at WPZ is required to wear prescribed protective gear. This gear includes rubber boots, disposable coveralls or cloth coveralls laundered after each use, eye protection, gloves, and facial mask. If working underneath an overhead tunnel while macaques are present, a hat is also mandatory. As a safety precaution, since 1991, WPZ has tested macaques annually (as well as opportunistically) for Herpes B, and assumes that the macaques are potential carriers of the virus even though they have tested negative.

In the past, before concerns of Herpes B exposure, macaques were netted and manually restrained as needed. Currently, the macaques must be immobilized for handling during veterinary procedures, including annual exams. WPZ does not currently have a chute or squeeze system to assist with this process. Most female macaques are herded into free-standing squeeze cages and then injected with an immobilizing drug. Male macaques generally cannot be persuaded in this manner, and are darted.

Darting is a trial for all parties concerned, and there is potential for injury from dart impact or the needle. More than one dart is often necessary since a full dose is not always received. Additionally, when animals become agitated, it usually requires more immobilizing agent to anesthetize an excited individual (Kreeger, 1996). In order to improve immobilizing procedures for both animals and staff, an injection training program was initiated in August, 2002.

The protective equipment required when working with potential Herpes B carriers such as lion-tailed macaques creates a barrier between macaques and keepers already separated by caging. The gear is hot and uncomfortable, and often the glasses fog up during training sessions. Even though keeper facial expressions are hidden behind the safety glasses and mask, training is still quite possible. Voice inflections take the place of facial expressions for reinforcement.

### **The training process**

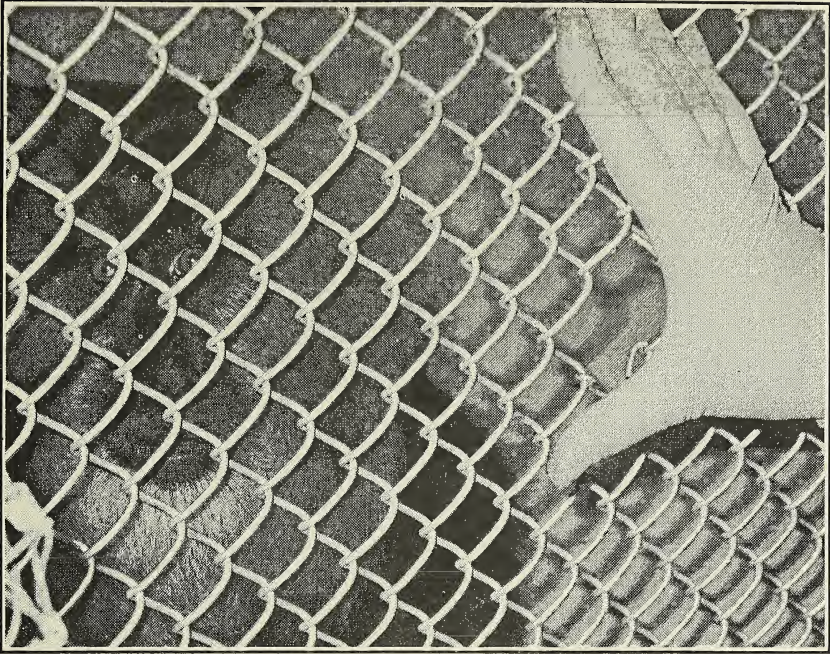
As a form of extra stimulation for our isolated macaques, the three individual males were selected for training first. After developing an effective method to injection train one male macaque, "Bosco," two additional males, "Bruno" and "Adam," were added to the program in December, 2002. One keeper assumed the role of primary trainer until the behaviors were established, and then the training was passed on to additional keepers. A detailed log of all training sessions continues to be maintained for consistency and communication between trainers.

The first step in the training process was to help the macaque recognize the "clicker" as a bridge, an indicator of a correct response and an upcoming food reward. This step was accomplished by calling the animal to "come here," clicking the clicker while saying "good," and then giving the animal a food reward. While the macaque was sitting attentively in front of the trainer, the trainer continued to click and reward. It took only a few sessions for the animal to expect a reward after hearing the click, and a few more sessions to adjust to this new relationship with the keeper.

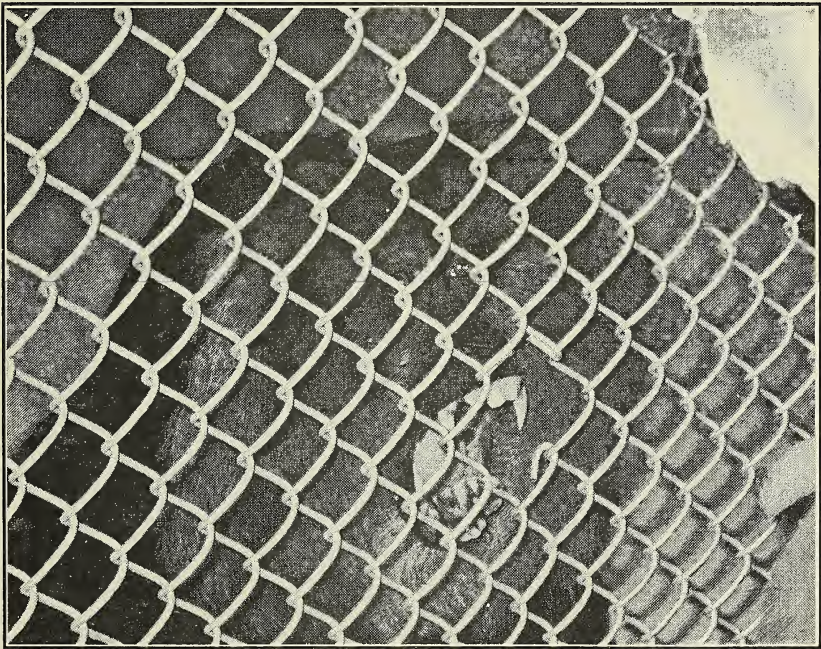
After a few sessions, it was determined that a variety of dried fruit and graham crackers chopped into 1/4" pieces were highly prized rewards. The macaques seem to prefer receiving multiple, smaller food items rather than one larger treat item. The other benefit to using small food rewards is that the macaques chew the smaller pieces much more quickly and are soon ready to work on the next behavior.

The next step in developing the training relationship was to work on a simple behavior so the macaque would learn to work for a reward, and begin to understand what is expected of it during a training session. The trainer tried unsuccessfully to interest the first macaque in a target, and then switched to having the animal present an open mouth. This behavior was easy to capture since the macaque would often give a mild open mouth threat to the trainer during the first few sessions. This behavior provides a good opportunity to check teeth and gums. During the training, each time the macaque opened his mouth wide, he heard a click, was told "good," and was rewarded. At first, each open mouth was mildly aggressive. But within just one session, he understood and started experimenting with opening his mouth. This behavior was rapidly tied to the audio cue "open," and the visual cue of fingers held together in a point in front of his mouth, then opening to a flat hand, with palm facing the macaque (Figures 1 and 2). The expected behavior was for the macaque to open his mouth in non-aggressive manner and hold his mouth open for a few seconds while the keeper took a good look inside. Within six sessions over two weeks, his responses became relatively reliable. The trainer changed to a variable reinforcement schedule, and aggressive open mouths were no longer displayed. Even after a five-week break from training, the macaque immediately remembered and performed an open mouth when requested. While working on this behavior, it is important to remember that the most likely risk of Herpes B exposure to humans is via macaque saliva (Kaplan, 1987).





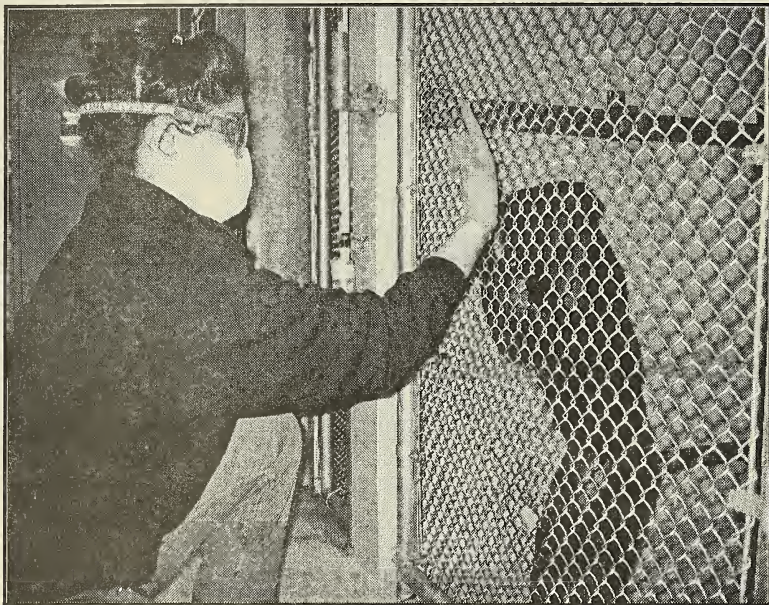
**Fig. 1 Open Mouth Cue**



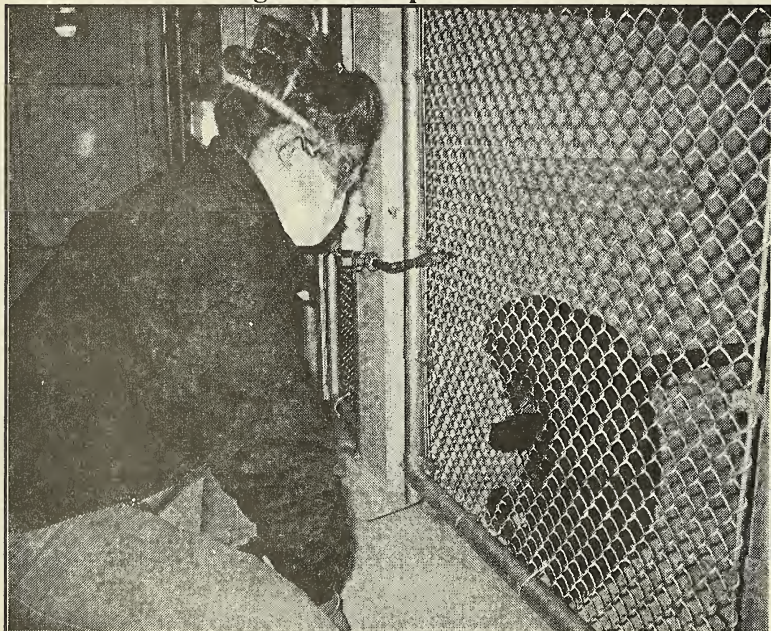
**Fig. 2 Open Mouth**



The second and third macaques that were trained learned the simple behaviors of standing on their hind legs while facing the trainer for a visual body check, and to sit down in front of the trainer. At first using a treat as a cue, the trainer said “up” and moved the treat up until it was at the height of the standing macaque’s head, then rewarded the animal. Once this was established, a hand cue was added, a fist with index finger extended up and the back of the hand towards the macaque (Figure 3). This hand position was held in front of macaque’s face and moved up in front of the caging while saying “up” until it was at the height of the macaque’s head when standing. The command for “sit” is the reverse of the “up” command, pointing the finger down towards the floor (Figure 4). “Sit” signals the end of the “up” behavior, and the macaque should sit down facing the trainer.



**Fig. 3 Stand Up Cue**



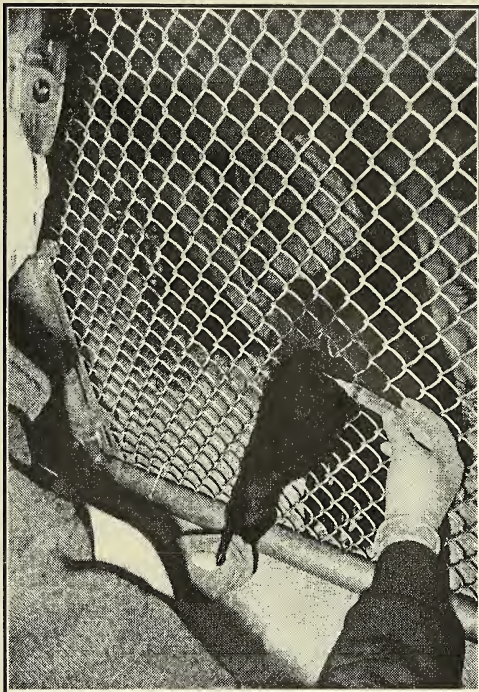
**Fig. 4 Sit**



## Injection training

Injection training began after the training routine and one or two simple behaviors were established. The goal of injection training was to inject any muscle mass on the macaque's upper arm as needed for immobilizations or intramuscular medications. Training initially began without a protective sleeve since one was not available. A sleeve has since been added to the training program and we hope to use it for injections in the near future.

Before starting injection training, the inside macaque holding cages required minor modifications. Two-inch diameter holes were cut in the mesh caging one foot above the floor. Training sessions were usually conducted in front of these holes, so the macaques were comfortable sitting in front of the hole. Using a treat as the cue, the macaques were shown a treat a foot outside the hole and rewarded for extending their arm outside the cage (Figure 5). The treat was then given through the caging to the side of the hole, never through the hole. The trainer rapidly learned that if the macaque was rewarded through the hole, the arm extensions are too quick. When the macaque simply reached towards the treat, but expected the reward elsewhere, it was easy to gradually increase the duration of the arm extension to allow enough time for an injection. The audio command "touch" was used from the start. The macaques were very willing to extend their arm through the hole on cue from the beginning, so training sessions focused on increasing the length of arm outside the caging and the duration of that extension.



**Fig. 5 Arm Extension**

First, basic arm extensions were established. Next, the trainer added a bamboo stick poised above and to one side of the hole, and began to gently press on the arm when fully extended. The macaques rapidly got used to the stick and the trainer began to press harder. The stick was then replaced with an empty syringe without a needle, then an empty syringe with a needle tip minus the needle, then an empty syringe with a needle tip with a long blunted needle, and finally a syringe with the plunger set at 1 cc (Figure 6). Because the medication to be injected is clear, it was not necessary to fill the training syringe with any liquid. The clicker and "good" was used while the arm was still fully extended and after the syringe was pulled away, not while the macaque pulled its arm back inside the cage. We do not use actual, sharp needles for training purposes in order to reduce the possibility of keeper contamination and because we are currently only training for immobilization purposes or occasional medicating, rather than for daily injections.

Training steps were slow with the first animal, Bosco, because the trainer was also learning (Table 1). Bosco's training stalled while the trainer attempted to use a boomer spool as a target rather than a hand holding a treat just out of reach. Unfortunately, the macaque was not interested in this alternative target. Nineteen sessions passed before the trainer gave up using the spool and continued on with the injection training steps using the original cue of treats. For the first macaque, 50 sessions over 15 weeks passed before he was injected. This was a time investment of approximately five hours of actual training time.



Injection training progressed much more rapidly with the second and third male macaques added to the program, perhaps due to a combination of increased trainer experience and because these macaques were interested observers of training sessions with the first macaque. One macaque was injected after eighteen sessions over three and one half weeks, approximately one and one half hours of actual training time. The other macaque was not injected until after 43 sessions over 10.5 weeks with two different trainers, a total of approximately four hours of training. The new trainer only worked with this animal seven times before successfully injecting.

The correct injection behavior response is that the macaque extends its arm through the hole in the caging when given the command "touch," and holds the arm in this position

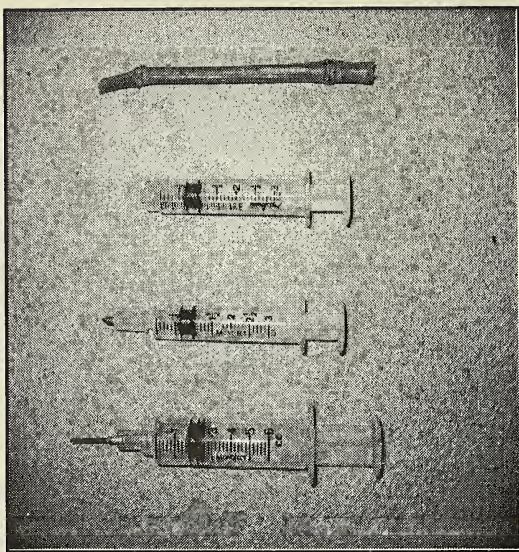
for enough time to comfortably move the syringe to press on their arm, depress the plunger, and pull the syringe away. If they do not hold their arm fully extended for this length of time, the macaque is asked to perform the behavior again until the behavior is executed correctly. Currently, the behavior is well established in all three macaques, and only occasionally are the macaques asked to repeat their arm extension.

#### **Preparation for actual injection**

Several days before the injection, holding areas are bedded with increasingly large amounts of grass hay, and perching is removed from the cage where the macaque will be immobilized. The hay bedding is increased to about a foot in depth, enough to pad a possible fall onto the cement once the animal has been injected. In the future, it may become necessary to periodically bed the holding cages heavily with hay to prevent the macaques suspecting imminent immobilizations when bedded only before exams.

On the day of the injection, it is important to maintain a semblance of normalcy so the macaques will be comfortable and willing to participate in a training session. Therefore, we do routine cleaning of the exhibit and some holding areas prior to attempting an immobilization. The one time we did not clean in the area prior to injecting, the target macaque was suspicious and would not participate in a training session until after we did some cleaning. With the design of the WPZ facility, it also did not work when we attempted to hand inject two animals in one day. Although the second macaque to be immobilized did not see the anesthetized animal, we do not have enough space to move all the other macaques outside during veterinary procedures. Consequently, some of the other macaques in holding were able to see the immobilized macaque being carried out by staff, reacted negatively, and the second macaque therefore became hesitant and unwilling to train.

Prior to injecting the macaque, the trainer requested the arm extension behavior performed several times before attempting the injection. This helped the trainer relax and get into a rhythm with the arm extensions, and the macaques "warmed up" as well and performed stronger arm extensions after the first few behaviors. After injecting the animal, the behavior was requested a few more times so the animals realize that not every arm extension results in an injection. The injected macaques often reacted with a small, surprised squeak, but usually stayed seated and were willing to continue extending their arm. One injected animal received only a partial dose, but was willing to participate in another training session after the trainer obtained a new needle, and then received a second, full injection. However, another macaque received a partial injection and then was not willing to be injected a second time.



**Fig. 6 Stick to syringe progression**



Table 1: Number of sessions before behavior established:

Macaque:	Behavior:		Injection training breakdown:							
	Clicker recognition & open mouth	Clicker recognition & stand up & sit down	Arm extend	Bamboo stick	Bamboo stick touch	Empty syringe	Syringe with plunger at 1 cc	Syringe + 1 cc + needle base	Syringe + 1 or 2 cc + blunted needle	Total days until injection trained
1.0 “Bosco”	6	N/A	4	N/A	10	6	1	5	9	50
1.0 “Adam”	N/A	19	1	1	4	1	2	1	8	18
1.0 “Bruno”	N/A	19	1	1	4	1	2	1	33	43

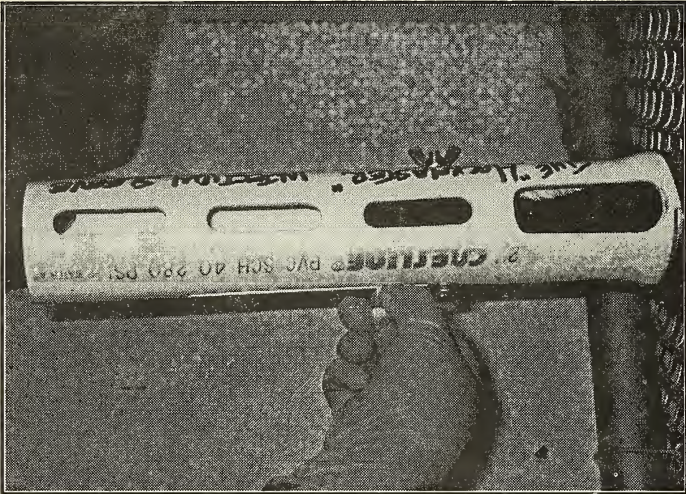
Some regression was expected after actual injections, but was usually managed within only a few training sessions conducted as soon as possible after recovery from the procedure. At first, the macaques tended to eye the syringe closely and perform only abbreviated arm extensions, but rapidly progressed again to the established behavior. It was often helpful to step back and first use a stick or syringe without a needle, before working up to the blunted needle by the end of the session.

**Injection training with sleeve**

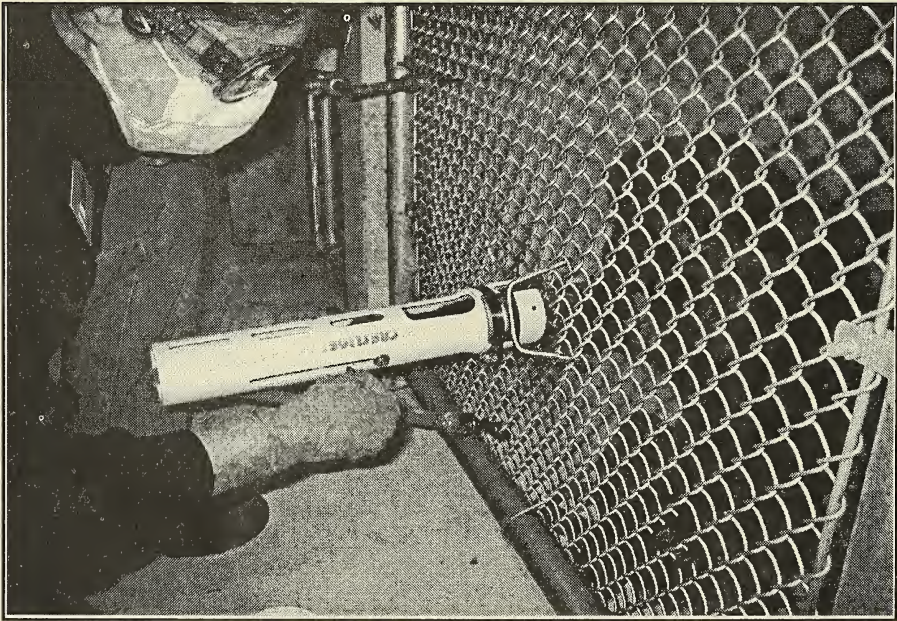
Adding a protective sleeve to the injection routine will improve keeper safety. Our injection sleeve was designed and built by Jon Hackett of WPZ's Exhibits crew (Figures 7 and 8). This design is very functional and flexible; it easily connects to the caging from the outside with two stainless steel hooks and an 11" rubber stabilizer strap, and can be readily moved from one training hole to another. The sleeve is constructed of a 14" length of 2 1/2" diameter PVC pipe, tapering to a 2" diameter after 2 1/2". There are two, 2 1/2" x 1" access holes for injections, additional holes for a good view of the arm inside the tube, and a stainless steel bolt covered with smooth plastic tubing inside. The bolt may be shifted close to the animal for initial training purposes or all the way to the end for the established behavior.

**Fig. 7 (at right)**  
**Injection Sleeve**

*(All photos for this article  
taken by Carolyn Austin)*



**Fig. 8 (below)**  
**Injection Training  
with sleeve.**





With the addition of a sleeve, the desired behavior is for the macaque is to grasp the bolt when given the command “arm,” and with a “hold” command, maintain this position while being injected and until given a release command. The bolt replaces the target used for arm extensions (the hand holding a treat just out of reach). To date, all three macaques are very comfortable with the sleeve, and will even relax a hand or arm in the sleeve in between behaviors. They all have learned to grasp the bolt in its fully extended position. Our next step will be to add the command “hold,” and introduce the syringe.

Currently, each training session begins by running through the simple behavior(s) mastered by the macaque (open mouth for one male, stand and sit for the other two males). Next, we practice injection training without the sleeve. These are all behaviors the macaques perform reliably and confidently. Finally, we work on the newest, in-progress behavior of injection training with the sleeve. We end either with solid progress on the new behavior or request a more established behavior in order to end on a positive note, followed by a jackpot reward four to six times the size of a usual reward. Training sessions usually last about five to seven minutes, once or more per day.

### **Passing off the training**

A training program is most successful when the training can be passed on to other trainers. Fortunately, it was a smooth process to train a second trainer to inject the macaques. In order to learn the routine, the new trainer crouched a few feet away and watched the primary trainer complete two training sessions. After each session, they discussed what happened and the primary trainer answered any questions. The new trainer also practiced the cues and reward sequences with the primary trainer acting as the macaque. On the third day, the primary trainer watched while the new trainer worked with the macaques. The macaques readily accepted the new trainer and were eager to work. As the new trainer became accustomed to the rhythm of the session, the macaques appeared to become frustrated only when they had completed a behavior correctly but weren't rewarded quickly enough. The fourth day, the new trainer worked alone with the macaques. The new trainer was able to successfully inject one of the macaques after only seven sessions. Training a third trainer was even easier. Following the same trainer training process, the macaques did not appear frustrated, perhaps due to their familiarity with the learning curves of new trainers.

### **Video**

Training sessions with all three macaques were videotaped, an exercise helpful to the primary trainer to refine technique and to observe potential superstitious behaviors. The video is also useful for new trainers to review the cues and expected behavior responses.

### **Future goals**

Near future training goals include adding the command “hold” so that macaques maintain behaviors until given a release command, injection training with the sleeve, and target training. Additional goals include presenting body parts for inspection and stationing on a scale for obtaining routine weights.

### **Conclusion**

Lion-tailed macaques are highly intelligent and quick learners. The three trained males are eager to engage in training sessions and appear to enjoy the extra attention and treats. Now, they even ignore macaques making faces at them across the hallway in order to participate in a training session. Additionally, immobilizations have become much less stressful for three of our lion-tailed macaques. They are truly rewarding animals to work with and show great potential and enthusiasm to learn.

## Summary of training suggestions

- Use multiple, smaller food items to maintain interest and speed.
- Move at a pace that is comfortable to both macaque and trainer. It is completely acceptable to take a step back in the training process when necessary.
- It is not necessary to poke the animal hard every time they extend their arm for injection training. A gentle touch with the blunted needle works very well. Remember that on the actual day of an injection, you will not be able to poke the arm on the practice extensions with the sharp needle.
- On the day of an actual injection, it is important to maintain a semblance of normalcy so the macaque will be comfortable and willing to participate in a training session.

## Note

Since the writing of this article, one of the trained macaques, Adam, has moved to San Diego Wild Animal Park in California. Additionally, introductions are currently underway to redistribute the remaining WPZ macaques in order to integrate Bosco and Bruno. Soon, we hope to maintain our 4.3 macaques in two pairs and one group of 2.1 individuals.

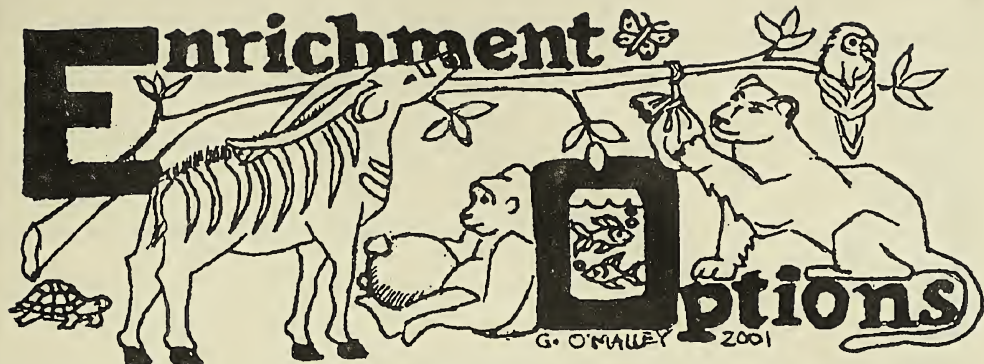
## Acknowledgements

Helen Shewman, Carolyn Austin, Ernie Rose, Asian Tropical Forest keepers, Janis Joslin, DVM, Darin Collins, DVM, Animal Health Department staff, Jon Hackett, David Shrake, Bret Sellers, Margaret White, and Jo Ann Bayrakci.

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*EO Editors - Dawn Neptune, Utah's Hogle Zoo  
and Rachel Cantrell, Disney's Animal Kingdom*

## Enrichment Survey Results

Following are the results from the Enrichment Survey which appeared in the February 2003 issue of *Animal Keepers' Forum*. Our thanks to Jan Rolette, former Co-Editor of the Enrichment Options column for tabulating the results. A total of 39 surveys were returned representing 33 separate animal facilities. Folsom Children's Zoo, Lincoln, NE, receives top marks for the most surveys returned from a facility. The very first survey returned was from Jackson Zee of the Panyu Bear Sanctuary in China! Thank you to everyone who participated in the survey.

### 1. Animal groups that are a part of the husbandry routine

Carnivores	74%	(29)
Elephants	7%	(3)
Giraffe	10%	(4)
Great Ape	15%	(6)
Hoofstock	53%	(21)
Marine Mammal	5%	(2)
Marsupial	20%	(8)
Primate	48%	(19)
Rhino/Hippo	13%	(5)
Rodent	43%	(17)
Amphibian	28%	(11)
Arthropod	20%	(8)
Birds	53%	(21)
Fish	13%	(5)
Mollusk	2%	(1)
Reptile	41%	(16)
Other	13%	(5)

\* Those in parenthesis are the actual numbers of keepers who had that animal in their routine

### 2. Is enrichment required by management as part of your husbandry routine?

Yes - 79% (26)      No - 21% (7)

**3. Average enrichment given for group per week**

Carnivores	5.6
Elephants	3.0
Giraffe	3.3
Great Ape	18.2
Hoofstock	3.4
Marine Mammal	1.0
Marsupial	3.4
Primate	7.0
Rhino/Hippo	5.0
Rodent	3.9
Amphibian	0.4
Arthropod	0.3
Birds	3.4
Fish	0
Mollusk	0
Reptiles	1.2
Other	3.8

**4. How soon is enrichment removed?**

Next day - 50%	2-3 days - 42%	4+ days - 8%
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**5. If normally removed the next day, any exceptions to keep in longer?**

\* listed starting in order of greatest response\*

- If continued interest
- If not food enrichment
- Large items
- NO exceptions
- If exhibit modification

\*next in list are single answers

- rodents/birds get “toys” for longer
- “toys” for Rhino & Elephant, non-edible
- more complicated, “messy” items
- if chimps are still playing with “toys”
- enrichment that can be “refreshed”
- staffing/time issues
- still in good condition, i.e. browse

**6. On average, how often are you able to observe enrichment?**

> 1 minute	12%	2-5 minutes	33%
5-10 minutes	33%	10+ minutes	22%

**7. Is enrichment divided into categories?**

Yes 62%	No 38%
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**8. If yes, rank your categories rate of use (1 most often)**

\*If no categories are used, generally what type of enrichment is most often used?

The general answer was “food”, “toys”, and “scents”, in that order

**9. Do you use a calender or other means of scheduling enrichment?**

Yes - 38%

No - 62%

**10. Are you required to document enrichment provided?**

Yes - 59%

No - 41%

**11. If yes, how?**

Brief listing in the daily report	13%
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Detailed description in daily report	15%
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Detailed description in enrichment log	34%
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Other	8%
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None	30%
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**12. When implementing new enrichment, do you have an approval form to fill out?**

Yes - 51%

No - 49%

**13. Who approves the enrichment request?**

Enrichment Coordinator	6%
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Lead Keeper/ Area Supervisor	18%
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Curator	25%
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Director	3%
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Veterinarian	21%
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No approval necessary	15%
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Other	12%
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\* Extra note: During the enrichment approval :

7 keepers had to obtain one persons approval

6 keepers had to obtain two peoples approval

10 keepers had to obtain three peoples approval

4 keepers had to obtain four peoples approval

Keep in mind that 12% did not have to get any approval to present new enrichment to animals

## A Post Script to the November 2003 EO Column:

Reading the article on enrichment ideas from the Frank Buck Zoo~ Parrot toys, reference was made to using leather shoelaces and I wanted to be sure to forward some information that keepers may not be aware of. I build bird toys for a living as well as work at ZuPreem. Research led me to the knowledge that most leather shoelaces are either tanned with an oil or tanned with formaldehyde - neither of which are good for the birds to chew on. You do not want to use leather shoelaces and be aware that craft leather may not be appropriately tanned either. Although the toy itself is great, keepers should be using a vegetable tanned leather source. There is a company with the following website that sells bulk vegetable tanned leather for birds and the zoo will be amazed at how inexpensive this source is. Website is [www.twinleather.com](http://www.twinleather.com) and they are coincidentally in TX. Hope this information is helpful. Sent in by Wendi Straddeck, Assistant Territory Manager Institutional/International Sales - ZuPreem.

## From Duffel Bag to Hay Bag

*Submitted by Stephanie DeGesero, Mammal Supervisor  
Abilene Zoo, Abilene TX*

We all have a "wish list" of enrichment items. Due to economic cut-backs, a lot of times this wish list never gets filled. That's why recycled items are so nice for enrichment programs. For a while I've had a nylon hay bag on my "wish list" to use with our hoofstock animals. Unfortunately, these bags sell for about \$60 each. This is certainly a luxury item that quickly gets tossed to the bottom of the request pile. I made a hay bag out of an old army duffel bag and it works great. We've used it with our zebras and had no problems. It took the zebras some time to get used to the new object in their yard but they quickly desensitized to the enrichment. The price is great and the washability allows it to be used with various animals. Also, the dark green color prevents it from standing out too much.

### Materials:

1 Army Duffel Bag  
Hot Glue Gun  
Glue sticks  
Scissors

### Directions:

1. Wash duffel bag in cold water and line dry
2. Cut seams to remove any exterior pockets/pouches
3. Cut a 12-15 inch square in the front of the bag
4. Turn bag inside out and glue the edges to stop any fraying seams on the square
5. Hang bag from fence or other structure and fill with hay



*(Ideas appearing in this column have not necessarily been tested by the editors for safety considerations. Always think ahead and use good judgement when trying new ideas. You are invited to submit materials for the Enrichment Options column. This might include recipes, toys, puzzle feeders, olfactory enrichment ideas, etc. Drawings and photos of enrichment are encouraged. Send to AKF/Enrichment, 3601 SW 29th St., Suite 133, Topeka, KS 66614-2054 USA. Eds.)*



*Institutions wishing to advertise employment opportunities are asked to send pertinent data by the 10th of each month to: Opportunity Knocks/AKF, 3601 SW 29th St., Suite 133, Topeka, KS 66614-2054. Please include closing date for positions available, and when setting these dates keep in mind that because of bulk-mail, most readers do not receive their AKF until the middle of the month or later. There is no charge for this service and fax or e-mail listings of positions which become available close to deadline are accepted. Our Fax is (785) 273-1980; e-mail: [akfeditor@zkskcoxmail.com](mailto:akfeditor@zkskcoxmail.com)< Listing may be sent as MS Word attachment. We are no longer located at the Topeka Zoo, so please note new address to avoid delays in processing.*

**Relief Keeper/Aviculture** - Cincinnati Zoo & Botanical Garden, Cincinnati, OH

Submit resumé to: Human Resources, Cincinnati Zoo & Botanical Garden, 3400 Vine St., Cincinnati, OH 45220; fax to (513) 475-6186; email to [hr@cincinnati-zoo.org](mailto:hr@cincinnati-zoo.org)< Only qualified candidates will be considered for an interview. This is a full-time (40 hrs per wk, flexible schedule) union keeper position, subject to the successful completion of a 90-day probationary period and the deduction of union dues. **Responsibilities:** include but are not limited to, the daily husbandry of the Cincinnati Zoo's bird collection, and the maintenance of the exhibit and off-exhibit areas in the Wings of the World facility. **Requirements:** Successful candidates will have previous experience with various avian taxa and water filtration systems; display the ability to work well with others; be team-oriented, and have excellent written and oral communication skills.

*The following two(2) positions are available at Out Of Africa Wildlife Park in Arizona. Please mail or fax resumé to Dean Harrison, Out of Africa Wildlife Park, 9736 N. Ft. McDowell Rd., Scottsdale, AZ 85264; phone (480) 837-6683; Fax (480) 837-7379. Visit their website at [www.outofafricapark.com](http://www.outofafricapark.com)< **Positions open until filled.***

**General Working Supervisor - Mammal, Reptile & Bird Depts.** - Out of Africa Wildlife Park

**Requirements:** Must have degree, four (4) years management, good people and communication skills. Experienced caregiving for many types of species, able to speak publicly to large audiences, while interacting with animals in a full contact setting is necessary. Lifting up to 50 lbs. may be required. Weekend and holiday work is necessary, according to shift. Salary depends on experience. Full benefits.

**Assistant Working Supervisor - Mammal, Reptile & Bird Depts.** - Out of Africa Wildlife Park

**Requirements:** Must have degree, two (2) years management, well experienced with reptiles, good people and communication skills. Experienced caregiving for many types of species, able to speak publicly to large audiences, while interacting with animals in a full contact setting is necessary. Lifting up to 50 lbs. may be required. Weekend and holiday work is necessary, according to shift. Salary depends on experience. Full benefits.

**Reptile Internship**

To apply send a cover letter, resumé, and at least two (2) (preferably 3) references to: Kristen Wiley, Internship Coordinator, Kentucky Reptile Zoo, 200 L & E Railroad, Slade, KY 40376. Or send via email to: [kyreptil@pop.mis.net](mailto:kyreptil@pop.mis.net)< Starting dates are flexible, but a minimum commitment of three months covering SPRING (April-June), or SUMMER (June - August), or FALL (September - November) is required. Deadlines for applications each year are: SPRING - February 1st; SUMMER - March 1st; and FALL - June 1st.

The Kentucky Reptile Zoo, a nonprofit organization, is seeking a student intern for the 2004 Fall season. The zoo is an educational exhibit, reptile breeding and venom research facility located near Kentucky's Red River Gorge and Natural Bridge State Park. **Responsibilities:** The intern will assist in the captive maintenance of the zoo's reptile collection, collect admissions to the exhibit, give interpretive talks and interact with the public, assist with educational outreach programs, and perform other duties as assigned. In addition, the intern will be responsible for the completion of at least one research project related to the field of herpetology. The intern will **not be involved** in the handling of any venomous reptiles. **Requirements:** Desirable qualifications include a willingness to handle snakes and other reptiles on a daily basis, ability to communicate effectively with people, writing skills, orientation to details, and self-motivation. The intern will be required to work both Saturday and Sunday, with days off during the week. Students majoring in the biological or natural sciences are preferred. Interns are required to be either college students or recent graduates. Former interns have arranged for academic credit with their institutions. Interns have also been successful in finding zoo keeper positions, with a hire rate of over 95%! Benefits include experience with the most extensive and diverse collection of snakes in the United States, housing, and \$55/week to cover expenses. Personal transportation is recommended. A valid driver's license is required.

**Big Cat Internships** - Tiger Creek Wildlife Refuge (TCWR), Tyler, TX as seen on Animal Planet in "Growing Up Tiger", TCWR is a division of Tiger Missing Link Foundation.

Commencement date: On-going duration: three (3) months on a month-by-month basis. For additional information to see what past interns have to say about Tiger Creek, visit [www.tigercreek.org](http://www.tigercreek.org)< Are you

interested in learning more about big cats or establishing a career path working in conservation as a zookeeper, a wildlife manager or a veterinarian? You can Earn Your STRIPES at Tiger Creek and obtain college credit through your college or university at the same time, there are up to four (4) positions available. At Tiger Creek you are more than a worker, you are considered a friend and we strive to build long-term working relations as we know you are the future animal caretakers! Interns are utilized for permanent animal care positions through a qualification system with opportunity for full-time paid animal keeper positions available based upon performance after training. **Requirements:** You provide a six (6)-day work week with a strong commitment for three (3) months, be capable of paying attention to details and follow safety rules, you must have your own transportation to and from the refuge and provide your own food while here. We provide room & board, uniforms, materials and curriculum, indoctrination and safety training. We even throw in use of the "tiger truck" for errands and entertainment adventures that you seek out. Within the new Intern House there is central heat and air, all furnished, a full kitchen, with two full bathrooms, two rooms shared by two students, a shared telephone line for incoming calls, internet access for email and surfing, a VCR, TV and even Satellite so that you and the other interns can enjoy Animal Planet during your off hours! All of this and a few rescued dogs or puppies in the backyard...because we want your stay to be as comfortable as possible while here at Tiger Creek. The Tyler-East Texas area has a lot to offer, there is horse back riding available at no cost to our interns, lakes within beautiful parks, movie theaters, numerous local night clubs and plenty of restaurants and much more.

**The following three (3) internship opportunities are available at the New Jersey State Aquarium -** The New Jersey State Aquarium husbandry department is currently holding open enrollment on all our internships.

#### **Avian Internship**

Interested candidates should submit a cover letter and resumé, transcripts, three (3) letters of recommendation, and an application from our website at [www.njaquarium.org](http://www.njaquarium.org). Please submit materials to: New Jersey State Aquarium, c/o Kyla Fox, One Riverside Drive, Camden, NJ 08103. Become familiar with daily activities involving our colony of African penguins, exotic birds, and reptile collection. **Responsibilities:** Duties include food preparation, exhibit maintenance, and creation of enrichment devices. **Requirements:** Candidates should be comfortable with public speaking and have course work in biology/psychology. Must be able to work outdoors and lift 50 pounds. Interns are required to complete a minimum of 120 hours and must be registered for college credits in either a two or four-year school. Internships may be completed during spring, summer, or fall sessions. All intern positions are on a volunteer basis and are unpaid.

#### **Marine Mammal Internship**

Interested candidates should submit a cover letter and resumé, transcripts, three (3) letters of recommendation, and an application from our website at [www.njaquarium.org](http://www.njaquarium.org). Please submit materials to New Jersey State Aquarium, c/o Collette Caprio, One Riverside Drive, Camden, NJ 08103. Learn daily activities involving animal care and training with our Seal Team. **Responsibilities:** Duties include food preparation, exhibit cleaning, creating enrichment devices and observing training. **Requirements:** Candidates should be comfortable with public speaking, have course work in biology/psychology, prior animal experience, be able to work outdoors, and lift 50lbs. Interns are required to complete a minimum of 120 hours and must be registered for college credits in either a two or four-year school. Internships may be completed during spring, summer, or fall sessions. All intern positions are on a volunteer basis and are unpaid.

#### **Fish and Invertebrate Internship**

Interested candidates should submit a cover letter and resumé, transcripts, three (3) letters of recommendation, and an application from our website at [www.njaquarium.org](http://www.njaquarium.org). Please submit materials to New Jersey State Aquarium, c/o Nicole Grandinetti, One Riverside Drive, Camden, NJ 08103. The Fish and Invertebrate department offers internships each semester to qualifying candidates. **Responsibilities:** The interns main responsibilities will be assisting the biologists with their daily duties including exhibit and holding tank maintenance, food preparation, feeding, filter maintenance, and learning all aspects on maintaining saltwater exhibits. **Requirements:** Interns must complete 120 hours within the semester working two eight-hour days. The typical hours for the day are from 7:30am to 4:30pm. Interns are also required to be registered for credits through a two or four-year institution. All Interns work under a volunteer basis and are unpaid.

#### **Big Cat Internship – Wildlife on Easy Street, Tampa, FL**

For more information contact Scott Lope at 813-323-5991 or email at [catfoto1@aol.com](mailto:catfoto1@aol.com). Two (2) positions available for six-month internship at TAOS accredited non-profit big cat sanctuary. [www.wildlifeoneasystreet.com](http://www.wildlifeoneasystreet.com) **Responsibilities** (include but are not limited to): daily husbandry, exhibit cleaning, diet preparation, feeding, operant conditioning and behavioral enrichment for the following



species: lions, tigers, leopards, cougars, lynxes, servals, caracals, bobcats, lemurs and other exotic animals. We provide invaluable hands-on experience, on-site housing and utilities, safety training and educational materials. Advanced training and long-term employment opportunities exist for the right candidates. **Requirements:** applicants must be willing to work six days a week, some holidays and follow strict safety guidelines. Hard work ethic and love of animals more important than degree.

#### **Internships - The Florida Aquarium, Tampa, FL**

Internships are available in Animal Health, Animal Programs and Husbandry departments. Internships available year-round for varying lengths of time and can be tailored to the individual student's needs. Internships are unpaid but provide valuable hands-on experience. Interested persons should send resumé to: Human Resources, 701 Channelside Dr., Tampa, FL 33602. For more information visit our website at [www.flaquarium.org](http://www.flaquarium.org) < **Responsibilities:** food preparation, feeding, cleaning enclosures, assist with medical procedures, animal observations, daily record keeping, enrichment activities, assist with training sessions and shows.

#### **Aviculture Interns - Keauhou Bird Conservation Center, Hawaii and Maui**

For more information on internships at **KBCC**, please send a resumé, cover letter, and the names and contacts of three (3) references to: Tracey Goltz P.O. Box 39 Volcano, HI 96785 or fax: 808-985-7034. **OR**, for more information on internships at **MBCC**, please send this information to: Mary Schwartz 2375 Olinda Road Makawao, HI 96768 or fax: 808-572-3574. For the Hawaii Endangered Bird Conservation Program at the Keauhou Bird Conservation Center (KBCC) on the Big Island of Hawaii and the Maui Bird Conservation Center (MBCC) on the island of Maui. **Responsibilities:** Daily tasks include husbandry duties such as: diet preparation, aviary and facility maintenance, behavioral observations of breeding birds, grounds keeping, predator control. **Requirements:** Applicant must be able to live with several roommates in a remote area and should show enthusiasm for work with captive endangered Hawaiian birds. Applicant must have a valid driver's license and health insurance. Internships last for a 3-6 month period. Interns receive \$20/day stipend plus housing. **Please, no phone calls or emails.**

#### **Internship Opportunities - National Aquarium in Baltimore**

To apply for any of the following internship positions go online at [www.aqua.org/education/internships](http://www.aqua.org/education/internships) to obtain an application form. A complete application includes contact information, answers to brief statements listed, and a copy of college transcript. Complete applications should be sent to: National Aquarium at Baltimore-Internships, Pier 3/501 East Pratt St., Baltimore, MD 21202.

Application Deadline: ongoing - 1 November 2003 for January and Spring terms of 2004; 1 April 2004 for Summer and Fall 2004 terms; All interns must complete a minimum of 120 hours of work within the selected term. Interns must receive college credit for their internship. Internships are unpaid. For further information contact the National Aquarium in Baltimore's Internship coordinator at [intern@aqua.org](mailto:intern@aqua.org) or call (410) 576-3888.

#### **Aquarist Intern**

**Responsibilities:** The selected candidate will assist the Aquarium aquarist staff with daily care of the Aquarium's invertebrates and fish. Assist with tank maintenance and cleaning; Prepare daily diets and perform daily feedings; Assist in the maintenance of back-up areas; Conduct precise record keeping; Perform special projects to be determined by the aquarist staff. **Requirements:** College juniors or seniors enrolled in an accredited college, pursuing a degree in Biology, Ecology, Environmental Science, or a related field. Must be able to lift 50 lbs, climb up a 6' ladder, and be able to squeeze across a 15' long x 12" wide platform.

#### **Aviculture Intern**

**Responsibilities:** The selected candidate will assist the Aquarium aviculture staff with daily husbandry activities in the South American Rainforest exhibit. Assist with and perform diet preparation and distribution; Conduct animal observations; Assist in the cleaning of holding areas, kitchen, and food prep areas; Provide enrichment to the aviculture collection; Perform special projects as determined by the aviculture staff. **Requirements:** Interest in working with birds. Enrolled in an accredited college, pursuing a degree in Biology, Zoology, Animal Behavior, Ecology, Environmental Science, or a related field.

#### **Herpetology Intern**

**Responsibilities:** Tend the "Hidden Life" exhibits (large wall terrariums where small, neotropical lizards, frogs, snakes and invertebrates are on public display); Mist and clean the off-exhibit colony of small arboreal lizards; Mist, clean and otherwise help tend the large, off-exhibit collection of neotropical frogs; Prepare diets for and feed the on and off-exhibit iguanas and tortoises; Tend the locust (live food) colony, orb-weaving spiders and colonies of non-venomous exotic arthropods (wood and hissing roaches, millipedes

and walking sticks); Assist in the maintenance of the live food cultures (fruit flies, springtails, crickets, rats, mice); Conduct and record animal observations; Perform special projects as determined by the herpetology staff. **Requirements:** Must be enrolled in an accredited college, pursuing a degree in Biology, Zoology, Animal Behavior, Ecology, Environmental Science or a related field. Must be comfortable working with frogs, lizards, rodents and terrestrial arthropods.

#### Horticulture

**Responsibilities:** The selected candidate will assist the Aquarium horticulture staff with daily activities. Assist with care of plants in the Rain Forest exhibits; Conduct plant maintenance, fertilization, propagation, and transplantation; Assist in display development; Perform special projects as determined by the horticulture staff. **Requirements:** Must be enrolled in an accredited college, pursuing a degree in Biology, Ecology, Environmental Science, or a related field.

#### Marine Animal Rescue Program (MARP) Intern

**Responsibilities:** The selected candidate will aid in all aspects of marine animals rescue program (MARP) operations, which involves the rescue, rehabilitation, and release of stranded marine mammals and sea turtles and implementing outreach efforts of the Aquarium's Ocean Health Initiative. The selected candidate is also responsible for technical and clerical assistance for the Conservation Department staff as necessary. **Duties include:** Animal Care – participating in rescue and release trips, daily feeding, medical treatments, facility maintenance including cleaning and water changes, behavioral observations, and record keeping; Outreach – learning to interpret the MARP artifacts and conservation messages and participation in seasonal outreach and public education programs at the Aquarium and off site; Other duties as assigned – field work, etc. **Requirements:** Must be college junior or senior majoring in environmental science or related field with course work in biology and ecology. Summer and January terms require 40 hours per week of work for 4 weeks. Spring and fall terms require 8 hours per day, one day per week of work.

#### Marine Mammal Trainer Intern

**Responsibilities:** The selected candidate is responsible for providing support to the marine mammal training staff. This internship's primary purpose is to teach the intern training theory. *There is limited hands-on animal contact during the internship.* **Duties will include:** Prepares daily animal diets and dispenses vitamins as instructed; Responsible for the cleanliness and safety of all animal back-up areas; Assists in training, husbandry, and medical sessions; Participates in pre-show and pre-session preparations; Periodically participates in sessions involving swimming during enrichment and play sessions – no animals involved; Other duties as assigned. **Requirements:** Must be college junior or senior majoring in life science or related field. Must have a basic understanding of marine mammal natural history. Must have good swimming skills. Must work well as a team member. Summer and January terms require 40 hours per week of work for 4 weeks. Spring and fall terms require 8 hours per day, one day per week of work.

#### Water Quality Lab Intern

**Responsibilities:** The selected candidate will assist in the water quality testing of all fish and mammal systems throughout the aquarium. Duties include testing water for salinity, pH, ammonia, nitrite, alkalinity, and copper according to lab procedures, and recording neat, accurate data. The selected candidate will work closely with the Lab Technicians and the Animal Husbandry staff. **Requirements:** Must be college junior or senior with general biology and chemistry work. Strong math skills and computer proficiency preferred. Must be available to work mornings.

#### SOS Rhino Seeks Volunteers

SOS Rhino is looking for volunteers interested in helping us in our efforts to save the Sumatran rhinoceros. Our Borneo Team is studying the demographics of the remaining animals in Tabin Wildlife Reserve to determine when patrol units, habitat protection, or translocation may play a role in the rhinos' survival. Please visit SOS Rhino's web site for detailed information: <http://www.sosrhino.org/programs/volunteer.php> Or contact Cindy Salopek, Projects Associate/SOS Rhino via e-mail at: [cindy@sosrhino.org](mailto:cindy@sosrhino.org)

*Positions posted with AAZK, Inc. may also be found on  
our website at [www.aazk.org](http://www.aazk.org)*

*Also, you may want to check out the AZA Member Institution job listings  
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*Other staff & volunteers*

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*Those not connected with  
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☐

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**Contributing/U.S.**

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Renew for 2 years & save  
*Full-time Keepers Only*

☐

**\$35.00 Affiliate**  
*Other staff & volunteers*

☐

**\$35.00 Associate**  
*Those not connected with  
an animal facility*

☐

**\$60 or up - Individuals**  
**Contributing/Canada**

☐

**\$100.00 or up**  
**Institutional/Canada**  
*Organizations/Institutions  
(requires Board approval)*

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